MUNICIPAL AGRICULTURAL SERVICE DELIVERY IN THE PHILIPPINES: THREE EMPIRICAL ESSAYS

by

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ABSTRACT

AILEEN VIRREY LAPITAN. Municipal agricultural service delivery in the Philippines: Three empirical essays. (Under the direction of DR. JOSEPH WHITMEYER)

This dissertation examines three aspects of municipal agricultural service delivery in the Philippines. The first essay investigates the effect of rural constituency share, fiscal factors, and provincial government performance on the municipal government's performance of agricultural service delivery. Random effects ordinal logit estimates suggest that for highly rural municipalities that are encumbered by resource and capacity limitations, agricultural support performance is contingent on the provincial government's performance. The second essay estimates the influence of income, political factors and neighbor-effects on agricultural spending of municipal governments in the province of Bohol. Results of the random effects estimation reveal the significant influence of income and spill-over effects from neighboring municipalities. Using social network data for participating mayors in Bohol, the third essay investigates how relative attitudes toward a prospective agricultural policy are influenced by embeddedness within the community of mayors in the province. Exact logistic estimates show that a higher betweenness centrality improves the odds that a mayor shares his peers' attitudes toward the economic benefits of organic farming promotion. The OLS estimations of policy attitude gaps reveal that a higher Bonacich centrality significantly increases the attitude disparities. Results suggest that convergence of policy attitudes necessitates the active engagement of "key actors" in policy-focused discourse. These essays depict an intriguing picture of devolved service delivery in which performance, policies and perceptions are influenced by interactions beyond local jurisdictional boundaries.

DEDICATION

I dedicate this work to my Nanay Bebang who would have been most proud,
my parents, Aurora and Tony for their love and support,
my siblings Alice and Audy who are always close to my heart,
all my friends—from Los Baños to Manila, Lubbock, Raleigh and here in Charlotte—-
who have prayed with, supported and encouraged me throughout this journey,
and to the One whose hand has bestowed undeserved favor, whose ways have brought me to this point of celebration, and whose plans remain sovereign over what is to come…

"Oh, the depth of the riches both of the wisdom and knowledge of God!
How unsearchable are His judgments and unfathomable His ways!
For who has known the mind of the Lord, or who became His counselor?
Or who has first given to Him that it might be paid back to him again?
For from Him and through Him and to Him are all things.
To Him be the glory forever. Amen." (Romans 11:33-36)

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INTRODUCTION

Despite modest improvement in the past ten years, poverty remains to be a rural phenomenon since about 70 percent of the developing world's extremely poor population lives in the countryside (IFAD, 2010). The problem of poverty coupled with concerns about food security brings agriculture-led development to the forefront of developing countries' priorities. Productivity-boosting innovations are a key part of agriculture-led development but small farmers rarely have access to such useful knowledge. The public sector in developing countries has therefore been providing agricultural research and extension to farmer-clients, taking the lead toward agricultural development.

In most developing countries, public provision of agricultural support services is undertaken under a centralized government system. In its fullest extent, such a system has the national government exercising extensive authority in the formulation, adoption and implementation of policies. It also retains control of the decision making. Following a policy choice, the central government determines the programs and activities that it will pursue to attain desired outcomes. It works through a bureaucracy extending to regional and field office levels, down to the local governments in what appears to be an administratively de-concentrated implementation structure. In such a centralized system, information asymmetry can undermine the capacity of policy decision makers at the national government level to fully gauge the applicability of policies and programs on the ground. They also cannot get assurance of holding local implementing agents accountable for their efforts. The national government therefore relies on hierarchical control and auditing mechanisms to ensure cooperative participation. Under the centralized system, ensuring efficient cooperation from the ground entails costly monitoring efforts from the

center. Such situation reflects what the literature on rural poverty reduction point out as implementation issues in a centralized approach to agricultural development (Farrington & Lomax, 2001; Ashley & Maxwell, 2001). These issues bear similarity with arguments about the failures of central planning in enacting policy put forth by "bottom-up" approach advocates in policy implementation research (Pressman & Wildawsky, 1973; Lipsky, 1980).

The "bottom-up" approach to policy implementation contends that local agents have better information about the local environment and the specific needs of target beneficiaries than policy actors at the center who are involved in the formulation of the policies and programs. On this basis, Hjern, Hanf and Porter (1978) argue that the engagement of local service-delivery actors in the early stage of planning, financing, and execution of the policies can lead to successful realization of policy objectives. Engagement of local agents in the early stages of the policy process enables them to develop affinity with the central authority and thereby identify with the latter's interest, which motivates them to exert best efforts toward the policy's goals (Coleman, 1990).

The phenomenon of administrative and political decentralization which has swept through many developing countries in the past few decades (Dillinger, 1995) provides a parallel concept to the "bottom-up" policy making approach. From the previous top-down practice of assigning local governments as implementation arms of the national government, the new environment of decentralized governance promotes greater local engagement in policymaking. Devolution of authority to local governments for provision and delivery of public goods brings governance closer to the citizens and with it, opportunities to adopt and effectively implement poverty-alleviating agricultural policies

and programs. Case studies from developing countries serve as evidence of how decentralization has served to improve representation of the poor and socially disadvantaged groups in society (Bardhan & Mookherjee, 2006).

Decentralization of governance is defined as movement of authority, responsibility and resources from the central to local units of government (Rondinelli, 1980). This definition embodies devolution, one of several interpretations of decentralization, and arguably the most used. Cheema and Rondinelli (2007) place devolution under the broader concept of political decentralization, which also includes support for citizen and civil society participation as well as power-sharing within the state in the pattern of federalism. In their survey of developments in the Asia Pacific region, de Guzman and Reforma (1993) identify three other concepts bureaucratic decentralization: 1) assigning functions from the national government to regional and other lower tiers of the central office bureaucracies (de-concentration); 2) handing over of public services to the private sector (privatization); and 3) engagement of alternative channels like non-government organizations and civil society groups. Cheema and Rondinelli (2007) classify de-concentration and delegation of authority to semiautonomous state agents under their concept of administrative decentralization, and set privatization with market liberalization, deregulation and public-private partnerships under market decentralization. These diverse interpretations of decentralization underline the importance of local governments, the private sector, civil society and bureaucratic units in the periphery in boosting political participation across groups in society as well as the multiplicity of channels through which public services could be delivered. This dissertation

concentrates on the understanding of decentralization that is most useful to the analysis of the local governance of agricultural service delivery: devolution.

Devolution is a step in the direction of local political autonomy because it points to the actual diminution of direct central control (Siedentopf, 1987). It gives local governments the authority to independently determine how devolved public services will be delivered in their jurisdictions. It shrinks the breadth of geographical area coverage for public service delivery, enabling local officials to identify and prioritize area-specific needs. Devolution also shrinks the communication and political distance between providers and users of public goods thereby simplifying the attribution of performance and improving the degree of accountability to local constituents. The limited area over which local governments operate makes it convenient for constituents to express specific policy concerns. Moreover, devolution simplifies performance attribution by bringing to light area-specific failures and successes that could be overshadowed by aggregated national outcomes. Being able to directly attribute performance to the local government leadership also promotes political accountability and citizen participation.

The Journey of the Philippines Toward Decentralization

Of the countries that were part of the political decentralization trend in the 1990's, the Philippines is noted as one of the most successful in decentralizing their agricultural extension systems (World Bank, 2000). The level of political autonomy enjoyed by local governments in the Philippines is a product of a long journey from its pre-colonial past toward democracy. Accounts of the history of local government in the Philippines point to a decentralized system as early as the pre-colonial era (De Guzman, Reforma & Panganiban, 1998). Autonomous village governments called "barangays" were already

established before the arrival of the colonizers from Spain. These village governments were led by a "datu" who exercised executive, legislative and judicial authority over his jurisdiction, with the assistance of a group of village elders as advisers. To ensure firm control over the islands, Spain installed a hierarchical colonial system of government composed of "barrios"—the equivalents of "barangays"—municipalities, cities and provinces. Over this system was the supreme authority of the Spanish colonial government based in Manila. Barrios were the basic units of government and their leaders were assigned the task of collecting taxes. Local government leaders were appointed and supervised by the colonial government in Manila, a practice that was slightly relaxed in the later years through the passing of the 1893 Maura Law. This law allowed the participation of local citizens in the choice of some of the local officers although control continued to be centralized.

Toward the conclusion of the Spanish colonial era came a brief run of the first Philippine republic and the establishment of an American colonial government close on the heels of the Philippine Revolution and the Spanish-American War. This period was characterized by movements away from and then back again to centralized governance (Tapales, 1998). The revolutionary government adopted popular and direct local elections and applied a level of supervision that could ensure a balance of power between the national and local governments. Although such a design is not uncharacteristic of the American model, the American colonial government at that time found it convenient to maintain centralized control of government, primarily to contain military struggles in some areas and to deal with a perceived shortage of leadership capable of running the local governments. Centralized control of local governments continued well into the

country's commonwealth years. During this period, the president had the authority to appoint mayors and to define the size, boundaries, names and seats of local governments (De Guzman, Reforma & Panganiban, 1998).

Moves toward greater political decentralization resumed after the Second World War, although this process was interrupted by the declaration of Martial Law in 1972 (Tapales, 1998). Post-war, central control of local governments eased and their autonomy in funds appropriation was promoted through legislation. The powers of cities and municipalities to tax were expanded through the Local Autonomy Act in 1959. Local governments were also authorized to assist in national agricultural extension and rural health programs and to act more independently of the national government in certain kinds of local action through the Decentralization Act of 1967. This same law increased internal revenue sharing and devolved some of the staff appointment responsibilities to the leadership of provincial governments. While these laws and others before them lay down a basis for decentralized governance, Tapales (1998) notes how the "centralist relationship" between the national and local governments had not been changed, owing perhaps to the varying governance styles of every incumbent president and the fact that local governments were directly under the authority of the executive branch.

The relegation of local governments to the role of implementation arms of national government policies would later become more apparent as martial law created substantial changes in the structure of government in the country. Through eight years of martial law, the president reassumed much authority in determining the existence, boundaries and leadership in local governments. Local elections were suspended and the president exercised the authority to appoint officials to local government seats. While the

regime did not decentralize authority to local governments and allow them to determine their course of action, it did delegate the administration of government policies and programs to regional governments, ministries, development councils and integrated area development clusters (De Guzman, Reforma & Panganiban, 1998). Central control of local governments was somewhat eased with the restoration of direct local elections for municipal, city and provincial officials just before the lifting of martial law in 1981, followed by the resumption of barangay elections soon after. Along with the changes that followed these developments was the renewed emphasis by the central government on strengthening the administrative and fiscal capabilities of local governments through the creation of the Ministry of Local Government and promulgation of the 1983 Local Government Code (LGC), which laid down the structure, roles and functions of local government units (Tapales, 1998). The system remained essentially centralized, however, as a result of long years under martial law.

Significant progress in decentralization could be observed after the 1986 revolution. Reforms culminated in the passage of the 1991 Local Government Code (LGC), which devolved the delivery of basic services including health, social welfare, environment, public works, education, tourism, telecommunication and housing, and agriculture. Personnel and assets were also devolved to help the local governments fulfill these new roles. Along with devolution, the LGC encouraged greater participation among citizens through mandated sectoral representation in local legislative councils and membership of non-government organizations (NGOs) in local boards and committees. Moreover, the Code increased the access of local government units to financial resources by broadening local taxing powers, by allotting a share of revenues generated from the

exploitation of local natural resources to local governments, and by increasing local governments' share of national taxes--the internal revenue allotment (IRA)—to 40 percent.

The 1991 LGC is currently well into the stabilization phase of its implementation, in which local governments have generally developed capacities for more autonomy. The national government has transitioned into the role of a partner to local governments through its agencies' provision of technical assistance for the delivery of devolved services. This, despite the failure to fully devolve services to the environmental, questions about the justness of revenue-sharing scheme between the national and local governments, certain actions of central agencies that tend to undermine local autonomy, and continuing efforts in the legislature to limit the extent of decentralization reforms, not to mention the disruptive effect of congressmen's use of pork barrel funds on implementation of local plans (Brillantes, 2003). While there might be variation in performance across the country, the decentralized system provides local governments with more elbow room to exercise strategic decision making in the allocation of available resources toward public goods delivery.

Characteristics of Philippine Municipal Governments

In the Philippines, local government units (LGUs) refer to provinces, cities, municipalities and barangays. Municipalities are in the middle of the hierarchy, with provinces and highly urbanized cities above and village-level governments or barangays below (see Figure1).

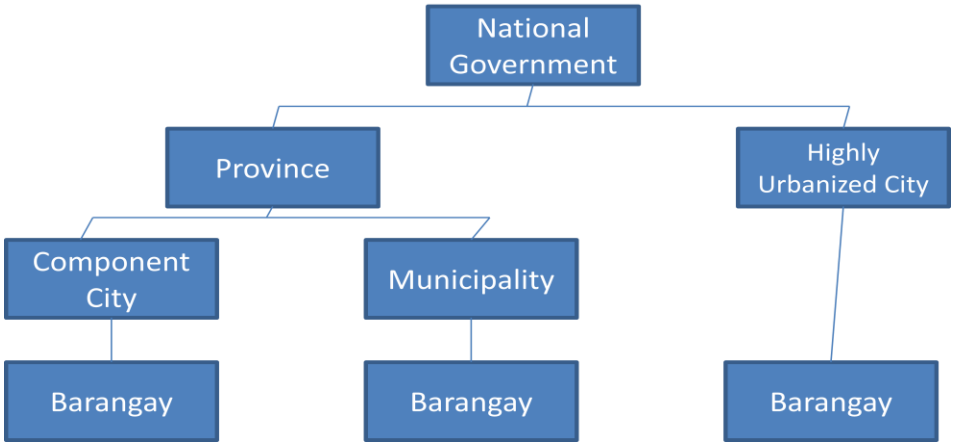

FIGURE 1: Hierarchy of the Philippine local government system

Municipal governments are differentiated from city governments according to population, land area and income criteria. According to the 1991 LGC, a jurisdiction qualifies as a city if it has at least an average annual income of 20 million pesos, and either a population size of at least 150,000 or land area of at least 100 square kilometers. On the other hand, a municipality must have at least 25,000 residents, land area of 50 square kilometers and average annual income of 2.5 million pesos. There are currently 1491 municipalities in the Philippines, which are classified into six income classes (see Table 1). Most of the municipalities belonging to the lower income tiers have agriculture-based economies.

A municipal government is led by a popularly elected mayor who exercises all executive authority over the LGU's daily affairs. The mayor sets the direction and fiscal strategies of the LGU. He or she has ultimate control over the day-to-day management of the government, including the administration of personnel. The municipal government also has a municipal council or "Sangguniang Bayan," which is the local law-making body composed of the elected vice mayor who presides over the meetings, eight

councilors, and representatives from the youth council and the League of Barangays. All elected municipal officials have renewable tenures of three years, with a limit of three consecutive terms.

In theory, the mayor and the council operate under a system of checks and balances. Aside from passing ordinances regarding various local issues brought to its floor, the municipal council discusses and approves the municipal budget, investment and other fiscal plans proposed by the local executive. The mayor has the power to veto any law passed by the municipal council but the council has the power to override the veto through a vote of two thirds of its members. It is not known, however, whether mayors' veto powers or municipal council challenges to proposed budgets have been frequently exercised. In any case, the influence of the mayor in day-to-day running of the municipal government and in local policy making is well established. This system of the strong leadership and direction by the mayor has been dubbed the "command and control" model of good local governance (DAP, 2005).

Another aspect of the municipal government's character is its relationship with the national government. The level of political autonomy that the 1991 LGC gave local governments has not completely done away with the supervisory role of the national government. This supervision by the national government, carried out by the Department of Interior and Local Government (DILG) of the executive branch, has enabled it to foster coordination and cooperation among LGUs in order to promote their autonomy and efficient performance. The LGC expanded the local revenue opportunities of municipalities by raising limits on taxes, fees and other charges that they can impose, increasing their share of real property taxes, and allowing them to form partnerships,

borrow and generate funds for local development plans. The law also expanded the share of LGUs in national revenues or internal revenue allotments (IRA) from 11 percent to 40 percent.

IRAs for LGUs is distributed among the different levels, with municipalities receiving the highest proportion at 34 percent while provinces and cities get 23 percent each and barangays receiving 20 percent. The IRA for municipalities is further distributed based mainly on population and land area. These intergovernmental financial transfers have been funding much of the expenditure responsibilities of local governments rather than locally generated revenues. In a recent report, IRA allotments cover about 90 percent of the expenses of municipalities (COA, 2011). Since the amount of resources received by municipalities is based on legally stipulated formula, it should not render them politically beholden to the central government. However, heavy dependence on intergovernmental fund transfers for the municipality's service delivery activities limits the flexibility of municipal governments in the conduct of their devolved roles. It renders local revenue-generation as less necessary in funding the municipality's service delivery activities. Moreover, such level of dependence on intergovernmental transfers could limit innovations in local service delivery, especially when innovations require non-incremental changes in local fiscal allocations.

Cabo (1998) describes the hierarchical administrative structure of Philippine LGUs as a system of inter-local supervision by the higher tier of government over the lower level. These supervisory relationships between local government levels have promoted accountability and collaborative relationships among the LGUs. To illustrate, provincial governments perform review functions over municipal ordinances and other

important decisions while municipal governments look over ordinances and other decisions passed by the barangays. The authority of the superior level of government also extends to the oversight and disciplining of the conduct of officials of the lower LGUs. In turn, the provincial governments are directly supervised by the Philippine president.

Municipalities are also organized into a voluntary national organization, the League of Municipalities of the Philippines (LMP). Under the LMP are three island-cluster organizations that annually meet for conferences, as well as provincial groups in which local mayors more frequently interact throughout the year. The LMP has been a forum for mayors to discuss concerns and collaborate on solutions, be it through policy advocacies for expansion of LGUs' governance roles or through jointly organized capacity building programs.

Municipal Governance of Agricultural Service Delivery: Three Inquiries

Decentralization reforms have redefined the role of municipal governments in the Philippines as providers of public goods. Massive devolution of public services has strengthened the authority and ability of these local governments to select the types of policies, programs and services deemed relevant to their localities' needs. Delivery of agricultural support is one of the responsibilities formally devolved to local governments by the 1991 LGC. Prior to the law, local governments have already been partnering with the national government in providing assistance to the sector of agriculture. Since the Department of Agriculture (DA) had been detailing field personnel to local governments, an existing personnel and administrative structure only eased the devolution of agricultural services (Tapales, Padilla & Joaquin, 1998). An interesting mark of devolution's progress was the staffing of municipal governments with agriculture officers

despite the fact that the 1991 LGC only mandated such appointments for the provincial governments. Henceforth, municipal governments have been undertaking and supervising the delivery of agricultural services to their respective jurisdictions, in parallel efforts to those of provincial government.

Philippine municipal governments best illustrate the opportunities and dilemmas of agricultural service delivery under a decentralized system. Being closer to the community than the national and provincial governments, these LGUs have greater awareness of local concerns, enabling their leaders to determine where to place agricultural service delivery in their list of priorities. However, these municipalities are as much prone to elite capture as any local government in a decentralized setting. They also face limitations in their technical capacity and resources, as well as scale diseconomies of producing public services to a smaller clientele. This dissertation is premised in these opportunities and dilemmas shaping local governance of agricultural services delivery.

The first essay drew from archives of performance and fiscal data to investigate the influence of share of the rural constituency, fiscal variables and provincial government performance on the municipal government's performance of agricultural support. It primarily set out to examine whether the municipal government's performance in providing agricultural support is significantly linked to local service demand as approximated by the rural constituency share in the population. To this ends, ot employed random effects ordinal logistic and panel logit regression.

The second essay is an inquiry into the determinants of agricultural services spending of municipalities of Bohol, an island-province in central Philippines. Recognizing the limitation of gross economic services spending data to actually reflect the municipal government's budget policy toward agricultural support, local expenditure allocations for delivery of agricultural services were drawn from fiscal reports submitted by the municipalities to the Bureau of Local Government Finance (BLGF). Panel logistic regression was the conducted to investigate the influence of local factors and neighbor-effects on municipal agricultural support spending.

The third essay looks into an important aspect of local governance--- the process of policy learning toward adoption of innovations. Political decentralization has enabled municipal governments to make policy innovation choices that have crucial governance performance and outcomes for localities. These choices are preceded by a process of learning that fundamentally shapes the local leadership's perceptions and receptiveness to a policy innovation. This study focused on the process of policy learning and investigated how socially mediated interactions between mayors explain their receptiveness to a new policy option---the promotion organic farming technology in the locality. Social network analysis (SNA) was applied to characterize the structural embeddedness of mayors, that is, their relationships and interlinkages with other mayors. Subsequently, these measures were used to examine whether mayors' structural embeddedness relate to policy learning as manifested by patterns of convergence in receptiveness to a new policy.

Studies in this dissertation emphasize the relevance of the municipal government's role in the public delivery agricultural services for local and national development. More importantly, these studies shed light on the local governance process

that determines the path and pace of agricultural development. The first essay presents a picture of the agricultural support performance at the municipal level while the second essay takes a subset of municipalities for a closer look at the various determinants of local governments' budgetary support for the agricultural sector. The third essay provides another angle to local governance of agricultural service delivery through a focus on patterns of policy receptiveness among local executives. Through these studies, this dissertation stands to offer empirically drawn insights about devolved agricultural service delivery in the developing country context of the Philippines.

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LIST OF ABBREVIATIONS

ARD	Associates in Rural Development
BIAD V	Bohol Integrated Area Development Cluster V
BLGF	Bureau of Local Government Finance
BLGS	Bureau of Local Government Supervision
COA	Commission on Audit
COMELEC	Commission on Elections
DA	Department of Agriculture
DAP	Development Academy of the Philippines
DILG	Department of Interior and Local Government
DOLE	Department of Labor and Employment
IFAD	International Fund for Agricultural Development
IRA	Internal Revenue Allotment
LGC	Local Government Code
LGPMS	Local Governance Performance Management System
LGSP-LED	Local Governance Support Program for Local Economic Development
LGU	Local Government Unit
LMP	League of Municipalities of the Philippines
LTC	Local Technical Committee
MOOE	Maintenance and Other Operating Expenses
NCR	National Capital Region
NGO	Non-governmental Organization
NOAP	National Organic Agricultural Program
NSCB	National Statistical Coordination Board
OAA	Organic Agriculture Act of 2010
SIE	Statement of Income and Expenditure
SNA	Social Network Analysis

CHAPTER 1: MUNICIPAL AGRICULTURAL SUPPORT IN THE PHILIPPINES: DOES PERFORMANCE CORRESPOND TO RURAL CLIENTELE SHARE?

1.1 Introduction

Agricultural support is one of the key public services that the 1991 Local Government Code (LGC) devolved to Philippine local governments. Despite the concern about this new role becoming overshadowed by flagship program activities of national agencies (Legazpi, 2001), it remains that local government units (LGUs) now have greater authority and flexibility to fit national agricultural programs and even innovate local policies according to perceived needs in their jurisdictions. The decentralization reforms have enabled municipal governments to determine the path and intensity of agricultural support in local areas. Since most of the municipalities in the country have rural-based economies, these LGUs can be deemed as drivers of local development in the greater countryside.

Decades since the devolution, the economic growth and welfare outcomes that defined rural development under the decentralized system of agricultural service delivery are modest at the aggregate level. The agricultural, fishery and forestry sectors have grown at an average of three percent from 2001 to 2010 (NSCB, 2013). During the same period, the agricultural sector has failed to catch up with rapid growth in the industry and service sectors, thereby reducing its share of workforce employment by 15 percent (DOLE, 2013). Poverty incidence has declined significantly for the entire country by

about 27 percent from 1991 to 2012 but the numbers remain highest in the countryside (NSCB, 2012). Among the factors that could be associated with these outcomes, local governments' performance as frontline providers of extension and other forms of support to the agricultural sector is arguably the most direct and highly substantial. Unfortunately, little is known about how municipal governments have fared in the rendering agricultural support, much less, whether their performance actually corresponds to the perceivable local needs, as originally envisioned for the devolution. Apart from an earlier field report (ARD, 1998) noting the greater tendency of mayors from rural areas to favor the implementation of agricultural programs, the question of locally responsive agricultural service delivery has not been much scrutinized.

At this point in the LGC's implementation, this study has addressed such curiosity by examining whether the municipal government's performance in providing agricultural support is significantly influenced by the rural constituency share in the population, among other determinants of performance. Using consolidated data for Philippine municipalities from 2009 to 2011, this study has estimated the performance level of municipal agricultural support as determined by demographic, fiscal and provincial government performance. In examining the local government's responsiveness to local service demand through focus on the influence of the rural constituency share, this study also investigated how this hypothesized predictor variable moderates by the effect of targeted spending for economic services. The analyses revealed issues with attributing local demand effects on performance through the use of rural constituency share while providing support for the significant influence of municipal income, share of internal revenue allotment (IRA) in that income, and the provincial government's performance.

This study contributes to the literature by presenting devolved service delivery in the developing country context of the Philippines. It highlights a less examined though very relevant service to a major economic sector in the country--- agricultural support. It is also one of the first efforts to consolidate and scrutinize a countrywide, multi-period survey of Philippine municipal government performance in recent years.. Moreover, it embodies several aspects of governance research through its focus on municipal government performance in devolved agricultural service delivery in the Philippines.

The study is primarily an inquiry into determinants of public service performance, which itself is multi-faceted. The performance measure used in this inquiry identifies with economy, efficiency and effectiveness— three dimensions of performance in the 3Es model, as well as with the IOO model of performance which focuses on inputs, outputs, and outcomes (Walker et al., 2010). However, it distinguishes its approach to the research question by revisiting a major premise for decentralization reforms—local government responsiveness to local demands—through the inclusion of rural clientele share as an objective measure of responsiveness. As findings have yielded a different story with regard to anticipated local responsiveness of service performance, this paper offers its own conjectures while also discussing the policy and research implications for the rest of the findings.

The subsequent section goes over the scholarship that has investigated local government performance in various perspectives and scenarios. It is followed by a presentation of the empirical design implemented to address the research question. Next are sections presenting the results and a section that discusses these findings. The final section addresses issues and implications for policy and further research.

1.2 Related Literature

Empirical research tackling the relationship between public management and performance has been an enduring theme in public administration research. The accumulation of studies investigating the subject is sustained by continued interest from practitioners and stakeholders in the practicable implications of the research findings. This strand of inquiry's appeal comes from the constant goal of developing of high quality and satisfactory public service provision.

The body of literature does not lean on a singularly established theory of government performance. Reviews of the scholarship instead observe the application several theoretical perspectives to wide-ranging empirical studies that investigate the determinants of performance (Boyne, 2003; Walker & Andrews, 2013). One of these perspectives involves the application of economic theory, particularly in looking at the influence of scale economies on local government performance. Studies that apply this perspective have explored the influence of organizational size. For example, Newton (1982) argues that despite the democratic merits of smaller units of government, large local government units are at least as efficient as their smaller counterparts. Similarly, larger government units are credited for their greater capacity to allocate fixed production costs while deferring to their smaller counterparts when it comes to responsiveness and efficiency in service delivery (Boyne, 1998). The closely related bodies of research on intergovernmental collaboration (Agranoff & MacGuire 2003; Amirkhanyan, 2009) and service provision ownership and partnership arrangements (Christoffersen, Paldam, & Wurtz 2007; O'Toole & Meier, 2004) also fall under the economic theoretical perspective.

Another theoretical perspective identified from the government performance literature comprise of contingency theories of organization, which generally condition success to management strategies rather than on the form or traits of the government unit (Walker & Andrews, 2013). This perspective highlights the role of strategic planning in service delivery performance, as seen in studies that tested the impact of specific management strategies on performance. To cite one, Walker, et al. (2010) explored and found support for the influence of strategic management and managerial networking on service performance of local governments. Boyne's (2003) review of empirical studies on the subject reveal the consistently observed effect of management reforms in public service performance.

The third theoretical perspective identified by Walker and Andrews (2013) is the resource-based perspective, which the takes into account the relevance of material and human resources to the local government's performance. The former is a rather straightforward factor since financial resources determine the level of spending toward service delivery activities; but its impact on performance is also argued to be contingent on effective management (Boyne, 2003). With regard to the significance of human resources, the perspective highlights the role of leaders and bureaucrats as comparably significant resources to the organization. This is clearly observable in the studies surveyed by Walker and Andrews (2013) which indicate the amount of attention managerial quality has received in management-performance research, particularly for the case of single-purpose public organizations in the US. In an alternative context, the significance of human resources is also tackled in terms of the impact of mayoral qualification on municipal government performance (Avellaneda, 2009).

The contingency and resource-based theoretical perspectives discussed in Walker and Andrews (2013) coincide with the two sets of variables that Boyne (2003) found as most consistent determinants of public service performance: those of resources and of management. Boyne evaluated five theoretical perspectives on the determinants of public service performance through a review of findings from a sample of empirical studies on the subject. He classified these perspectives into those of resources, regulation, organization, market structure and management. After finding thin and even contradictory results for the corresponding theoretical perspectives, Boyne de-emphasizes regulatory arrangements, organizational structure, size, and market structure as significant objects of public management reforms. He instead finds consistent support for the influence of financial resources and management reforms in service performance and hence prods future research toward the exploration of these two issues as well as the examination of moderated and mediated relationships among the identified determinants.

Scholars of decentralization view the increasing roles of local governments in service delivery as a form of governance reform, particularly in developing countries that come from centralized governance tradition (Andrews & Shah, 2003; Dillinger, 1994). The process is expected to promote service delivery performance by building a closer relationship between local officials and citizens. Narrowed distance between political agents and their citizen-clients can bridge information gaps with regard to the efforts of the political agents in the delivery of devolved public services (Keefer,Narayan & Vishwanath, 2003). As the responsibility for the delivery of public services is devolved to the local governments, political factors become relevant to performance. Decentralization research in developing country settings have focused on political factors

representing the democratic advantages of service delivery through local governments. Eckardt (2008) explores the interactions between political institutions and public sector performance. He finds evidence in Indonesia that the extent of political accountability, either through sanctions on public servants' opportunistic behavior or narrowed-down informational gaps about government activities, determines performance outcomes. Gottlieb (2010) similarly points to the influence of political competition and information asymmetry on government performance in Mali. Other works in the context of developing countries have looked into external voice, government transparency, and politicization (Kaufmann, Mehrez & Gurgur, 2002), partisanship (Jones, Sanguinettib & Tommasi, 2000), as well as participation and accountability (Blair, 2000).

While decentralization research discussed above offers a complementing set of explanatory variables to those associated with the public management-performance research, much of its attention is toward the agent-client relationship between the local governments and their constituents. The "external voice" examined by Kaufmann, Mehrez and Gurgur (2002) specifically applies to the ability of citizens to express feedback to government performance but does not cover the communication of their service needs to local service providers. The latter is critical assumption to the argued advantage of local governments in ascertaining and responding to service demands in smaller, more homogenous constituencies (Oates, 1972). Although observations of social services in some developing country settings suggest that low demand does not necessarily explain failures in service provision (Keefer & Khemani, 2005), the effect of service demand from the local constituency, has yet to be empirically established, particularly for other types of public services.

The breadth of the research on local service delivery provides a wealth of information to explain performance. Much of the research exploring the link between public management traits and strategies has come from the American context, with growing contributions from other country settings (Boyne, 2003; Walker & Andrews, 2013; Blair, 2000 among others). Local governments in developing countries that later joined the decentralization trend however deal with different political dynamics than most of their Western counterparts do. Moreover, every country-case is characterized by its own unique political, economic and institutional context to which geographically generalized findings have limited applicability in terms of guiding policy making toward improved service delivery. This study provides the context of Philippine municipal government performance but also for casting light into agricultural support, one of the key public services devolved to local governments in the country yet the least examined in the entire literature.

1.3 Hypotheses

One of the advantages attributed to devolution is the bridging of the distance between the government and the citizens. As certain service delivery responsibilities are given to local governments, the gains in responsive service delivery may be realized through efficiency and downward accountability. From the economic efficiency argument, local governments are seen to more easily ascertain and respond to the local service needs (Oates, 1972). This is because smaller populations in local areas are less likely to be as diverse as the populations served by higher level of governments, making service priority choices simpler. At the same time, elected local officials become

politically accountable for satisfactory provision of devolved public services and are hence motivated to perform at the level acceptable to voters.

The influence of devolution is complicated by a few challenges such as the threat of elite capture, or when local officials develop economic and political incentives to accommodate interests of dominant groups in the community (Cheema & Rondinelli, 2007; Bardhan, 2002; Ashley & Maxwell, 2001 Crook & Manor, 1998; Tanzi, 1995). Another challenge to local service delivery is capacity limitations of the LGU. For one, additional responsibilities exert a strain on local government resources despite expanded financial transfers from the national government. At the same time, disparities in local economic conditions that translate into locally generated revenues can result in uneven financial capacities to fund public services (Bahl, 2009). Furthermore, the limits in technical and management capacity to efficiently produce and deliver public goods can hinder performance for services like agricultural support (Andersson, Gordillo de Anda and Van Laerhoven, 2009).

This study takes in the efficiency and accountability arguments for local service delivery, along with the posited influences of local political dynamics and the organizational traits of the local government, in order to examine the determinants of agricultural support performance of municipal governments in the Philippines. In so doing, it considers the public management factors that have long been subject of public administration scholarship, as well as the political factors deemed to arise from the devolution as described above. It also takes into account other influences that are external to the LGU such as the provincial government's own performance.

In most of the studies that investigate how public service delivery performance may be explained by organizational traits, management, political and other factors, it would seem that the demand for particular services have been considered constant for all units. Such assumption seems reasonable for services that pertain to common basic needs of local citizens such as public order and safety, education, health and the like. In the case of the Philippines, however, the devolved responsibility of providing agricultural support may not be equally prioritized by local governments. Despite the earlier argument of higher degrees of homogeneity at the local level, some municipalities are simply more rural than others. Variations in the degrees of homogeneity among local constituencies, particularly in terms of dependence on the agricultural sector for livelihood, matter to how much local governments prioritize this sector-specific service. Some municipal governments may hence exhibit a higher level of support for the agricultural sector as a response to a relatively larger rural constituency. Conversely, low performance of agricultural support may only be a corresponding result of a relatively smaller rural constituency whose needs and political pull on the local government are overwhelmed by those of citizens from other sectors. This study tests such influence of the rural constituency's relative size on agricultural support performance.

1.3.1 Municipalities with higher proportions of rural constituents will exhibit higher performance levels for agricultural support.

The amount of available financial resources limits local government activities. Regardless of a municipality's priorities, a bigger pie or an increase in funds is expected to boost capacity to deliver services, including those for support of the agricultural sector.

This study tests whether municipalities that have more financial resources will exhibit higher level of support for the agricultural sector.

1.3.2 Higher income municipalities will exhibit higher levels of agricultural service delivery performance

The Philippine's experience of decentralization reforms brings in another context to the influence of financial resources on local service delivery. While the 1991 LGC increased revenue-generating opportunities for municipal governments, the expanded internal revenue allotments (IRA) to LGUs continue to fund much of the expenditure responsibilities of municipal governments. Heavy dependence on these intergovernmental fund transfers indicates some difficulty in generating more resources from the local economic base, either due to limited capacity of the LGU or lack of opportunities in the locality's weak economic base or a combination of both. This can curb the flexibility of municipal governments in service delivery as they face practically fixed budget constraints in the IRA. Municipalities that are less dependent on IRA are hence expected to exhibit higher levels of support to the agricultural sector.

1.3.3 Less IRA-dependent municipalities will show higher levels of agricultural service delivery performance.

Local governments in the country regularly allot a significant proportion of their resources toward provision of economic services. This account covers funding for poverty alleviation and other development projects and activities in the jurisdiction. Agriculture is one of the main service sectors under the umbrella of economic services in a municipality. Increased investment of resources toward delivery of economic services is hence expected to positively affect the delivery of agricultural services in the area. If

agriculture is the major economic base of the locality, the effect of increase in the economic services on the support for the sector would more likely be greater. This study therefore also expects to find a moderating effect of the relative significance of the agriculture sector in the community on the relationship between the intensity of the municipal government's economic services and its performance in the delivery of services to the agricultural sector.

1.3.4 Municipalities that have a higher share of economic services spending will exhibit higher performance levels of in agricultural service delivery, and

1.3.5 The influence of the share of economic services spending on the performance of agricultural support is higher in more rural areas.

Just like municipalities, provincial governments are mandated to provide support to the agricultural sector. Being at the higher level of the local government hierarchy, provincial governments are endowed with more resources and authority over all the devolved services. These LGUs subject municipalities to administrative supervision and influence over a wide array of political concerns. The provincial government's performance in supporting of the agricultural sector can promote or hinder municipal performance, not only through direct provision of resources from the higher government tier, but also through the indirect transfer of standards regarding local agricultural service delivery. This study tests such relationship.

1.3.6 Municipal performance of agricultural sector support is higher for high-performing provinces.

1.4 Data and Methodology

The hypotheses were tested using an unbalanced panel dataset profiling 1617 city and municipal governments assessed for agricultural support performance in the Local Government Performance Monitoring System (LGPMS) from 2009 to 2011. LGPMS is a web-based self-assessment tool developed by the Department of the Interior and Local Government's (DILG) Bureau of Local Government Supervision (BLGS). It is designed to aid the measurement and monitoring of local government capacities and limitations in the delivery of essential public services (Wilde, et al., 2008). LGPMS publishes the local government performance ratings generated from indicators reported by LGUs on 17 service areas. Only about one percent of all LGUs at this sub-provincial level, mostly highly urbanized cities with very small or otherwise non-existent agricultural sector, were excluded from the LGPMS reports. In the Philippines, cities are distinguished from municipalities based on income, land area and population characteristics. Cities essentially have more urban areas than municipalities although most cities outside the national capital region (NCR) have a significant local agricultural sector and maintain agricultural service delivery functions. Except for highly urbanized and independent component cities which are not under the administrative supervision of the provincial government, there is very little difference in the operation of city and municipal governments. The exclusion of these types of LGUs from the LGPMS therefore enables the analyses to relax any influence of the differences in degrees of political autonomy from the provincial government. The city and municipal governments used in the analyses are collectively in the paper as municipal governments.

An election cycle for Philippine local governments is three years. Since the panel data covers three consecutive years, it can account for any fluctuations in performance that may arise from opportunistic behavior in the local governments, particularly during pre-electoral periods when public expenditures and activities are adjusted for higher visibility to the electorate (Veiga & Veiga, 2007). Income sources, spending allocations, demographic and electoral statistics, and service delivery performance were gathered from archives of government agencies such as the Bureau of Local Government Finance (BLGF), the Commission on Elections (COMELEC), the National Statistics Coordination Board (NSCB) and the Bureau of Local Government Supervision (BLGS).

1.4.1 The Dependent Variable

Local government service performance is conceptualized and classified in different ways. The way that the Local Government Performance Management System (LGPMS) draws performance scores from input, productivity and outcome indicators (Wilde, et al., 2008) corresponds to at least two models that have summarized the dimensions of performance. One is the 3Es model which emphasizes economy, efficiency and effectiveness and the other is the IOO model which focuses on inputs, outputs, and outcomes (IOO) of the service (Walker et al., 2010). This study identifies with both models, at least in terms of the focus on the 3Es and the input-output aspects of performance, as it takes advantage of a welcome innovation in the LGPMS.

LGPMS performance ratings range from 1 to 5, with a rating 5 indicating excellent performance and a rating of 1 signifying very low performance. In the LGPMS, LGUs earning less-than “Excellent” ratings can benefit from a report of suggested improvements in their operation. A sample performance assessment report is attached

(Appendix A) to illustrate the kind of feedback provided to the LGU. While the LGPMS has served as a resource for use in local administrative and policy decision making as well as for establishing performance benchmarks, it has an wealth of data that could shed light into the comparative of local service delivery in the country. This resource is tapped to operationalize the performance of municipal governments in delivering agricultural support services in their localities. Corresponding LGPMS ratings are utilized as values for the dependent variable in the model for agricultural service delivery performance. Although originally reported as continuous score values, performance is interpreted in LGPMS according to the five performance ratings described here. This study uses the categorical ratings received by each municipality, setting the dependent variable to the ordinal format. This dependent variable is labeled in the estimations as MUNAG.

In the LGPMS, performance ratings are drawn from information submitted by local government representatives. A sample data capture form is attached (Appendix B) to illustrate how such information is obtained. At reporting, local officials provide information about the extent to which the LGU funded construction or rehabilitation of irrigation facilities and necessary roads. They also indicate any type of provision for post-harvest equipment as well as for credit facilitation, production support, research and development, and marketing services. Additionally, these officials submit self-assessed accounts of impact to target beneficiaries and service innovations. Such information is stored in the system as raw data and also used as input to an automated performance report made available to the LGUs and the public. Considering that the information entered into the system are essentially subjective assessments of the reporting local official (as opposed to raw statistics), the information used in the computation of the

LGPMS score may run into questions of validity. For the part of the LGPMS team, the issue of validity is addressed by requiring LGU respondents to affix their signatures in a certification page attached to the data capture form as a means of testifying the validity of the provided information (LGPMS, 2009).

1.4.2 Independent Variables

1.4.2.1 Rural Constituency

The term, "rural" has strong association with agriculture. This is very true in the Philippines where agriculture is known to play a major role in generating income and employment in the country's rural areas. The National Statistical Coordination Board (NSCB, 2012) simply relates rural areas with low population density. The term connotes greater availability of land, which for most of the countryside, is utilized for agricultural activities. In considering the role of local demand in the local government's performance of agricultural service delivery, a measure of the agricultural sector's relevance to the municipality is valuable. In order to account for such influence, this study uses the proportion of the rural population to approximate perceivable local demand for agricultural support. Values for this variable were drawn from village-level census data published in the NSCB database as well as from estimates based on reported annual growth rates for population.

1.4.2.2 Financial Determinants

Values for all the financial resource variables used in the model are based on the consolidated municipal statements of income and expenditure (SIE) archived at the BLGF website. The municipal government's annual gross revenue (REV) is used here to account for the influence of financial resources on local government service delivery

performance. It is equivalent to the gross amount of funds available to the municipal government for allocation toward agricultural support.

Transfers from the central government called Internal Revenue Allotments (IRA) contribute to the local government's revenues. IRA amounts are based mainly on population and geographic size of the jurisdiction. The share of the IRA in the LGU's financial resources indicates the extent of its entrepreneurial capacity to generate revenues locally. This study computes the proportion of IRA-sourced funds to total revenues (similarly labeled as IRA) and uses it as a covariate in the performance model for municipal agricultural support.

To account for the influence of economic sector support spending on agricultural support performance, the share of this expenditure item in the over-all expenditure of the LGU was computed. This variable, labeled as ECON, includes all expenditures toward promotion of economic growth for the municipality and is hence considered as influential to poverty alleviation goals. It is also multiplied with the rural constituency share to capture any moderating effect the latter may have on the expenditure share's influence on performance.

1.4.2.3 Provincial Government Performance

The LGPMS also publishes performance scores for provincial governments' delivery of support services to the agricultural sector at their level. Information for the provincial government performance is gathered in the same way as those for municipal governments. These provincial-level performance scores (PROV) were used as explanatory variables in the model for the municipal government's performance.

1.4.3 Model and Estimation Technique

Since agricultural service performance is represented in the dataset in terms of ranked categories, ordinal logistic estimation was seemingly the appropriate technique to model the influence of the hypothesized determinants on municipal performance. However, as the model is applied to cross-sectional data, it may be limited in addressing the heterogeneity of municipalities across the archipelago. There are traits of these LGUs that are crucial to explaining agricultural service delivery performance, yet can be missed in the estimations. One such characteristic is "competency" which is equivalent to professional and entrepreneurial skills of designated staff. Since such information is difficult to measure for each subject, more so for all municipal governments in the study, the variable cannot be included as regressor in the model for agricultural support performance. Omission of this variable can lead to bias in the estimates.

By using panel data, this study can control for competency characteristics that are specific to each municipality. This is particularly important since measures of staff competency are not available for analysis, yet are crucial in determining performance of the LGU. The primary estimation method applied here is random effects ordinal logistic estimation for panel data. It looks into how the relative significance of the sector influences the municipality's performance in this area while also testing the relationship between the local government's extent of economic service delivery, fiscal capacities and the external influence of the provincial government's support for the agricultural sector. The general model below is estimated for 1617 unique municipalities in the Philippines over a period of three years through maximum likelihood estimation.

$$MUNAG_{it}^{*} = x_{it}\beta + \nu_i + \varepsilon_{it} \quad (1.1)$$

and

$$MUNAG_{it} = \begin{cases} 1 \text{ (Very Poor)} & \text{if } MUNAG_{it}^{*} \leq k_1 \\ 2 \text{ (Poor)} & \text{if } k_1 < MUNAG_{it}^{*} \leq k_2 \\ 3 \text{ (Fair)} & \text{if } k_2 < MUNAG_{it}^{*} \leq k_3 \\ 4 \text{ (High but not Excellent)} & \text{if } k_3 < MUNAG_{it}^{*} \leq k_4 \\ 5 \text{ (Excellent)} & \text{if } k_4 < MUNAG_{it}^{*} \end{cases}$$

The equation in 1.1 is the latent linear response model from which observed ordinal responses $MUNAG_{it}$ are generated. In the equation, *i* represents each municipality over each year *t*. The covariates of interest are represented by x_{it}. The errors ε_{it} are distributed as logistic with mean zero and variance $\nu_i \ \frac{\pi^2}{3}$, and are independent of ν_i. In the estimation of this model in Stata13, the assumption of identically distributed disturbances is alternatively relaxed by employing a clustered sandwich estimator for the variance-covariance matrix (VCE). Use of this VCE specification is deemed unbiased cluster-correlated data (Williams, 2000). In this study, municipal ID was selected as the clustering variable.

1.5 Results

1.5.1 Trend and Distribution of Municipal Performance

The performance ratings of agricultural sector support of municipalities across the country for each year are illustrated in the Figures 1.1, 1.2 and 1.3. A perfect score of 5 (represented by blue color) denotes excellent performance. Performance scores of 4 to 1 indicate increasing degrees of improvement needs for the LGU. Green-shaded municipalities are those that exhibited high level performance but still have some areas that need improvement. The light yellow-shaded municipalities indicate fair performance while the light and dark red-shaded ones have poor and very poor ratings, respectively.

Overview of all three maps gives an idea of the prevalence of "High but Not Excellent" ratings (green color) in any of the years. On the other hand, the "Excellent" performers are spread out in 13 of the 16 regions of the country.

Table 1.1 summarizes the distribution of the municipalities according to the five levels of agricultural support performance rating. On average, about 53 percent of the municipalities received a rating of "High but Not Excellent" performance. On the other hand, municipalities that were rated "Excellent" make up only one to two percent. About 32 percent received "Fair" rating. Poor and very poor performing municipalities together make up 13 percent. The trend over the three-year period seems to be a very slow movement of the lower performing municipalities toward higher performance rating categories. The discussion of the regression estimates in the later part of this section looks into such variations in municipal service delivery performance across municipalities and time.

TABLE 1.1: Distribution of municipalities by agricultural support performance.

Performance	2009		2010		2011	
Rating	No.	%	No.	%	No.	%
Excellent	19	1	24	2	39	2
High	750	49	811	51	929	58
Fair	527	34	539	34	464	29
Low	161	11	140	9	100	6
Very Low	74	5	75	5	62	4
Total	1531	100	1589	100	1594	100

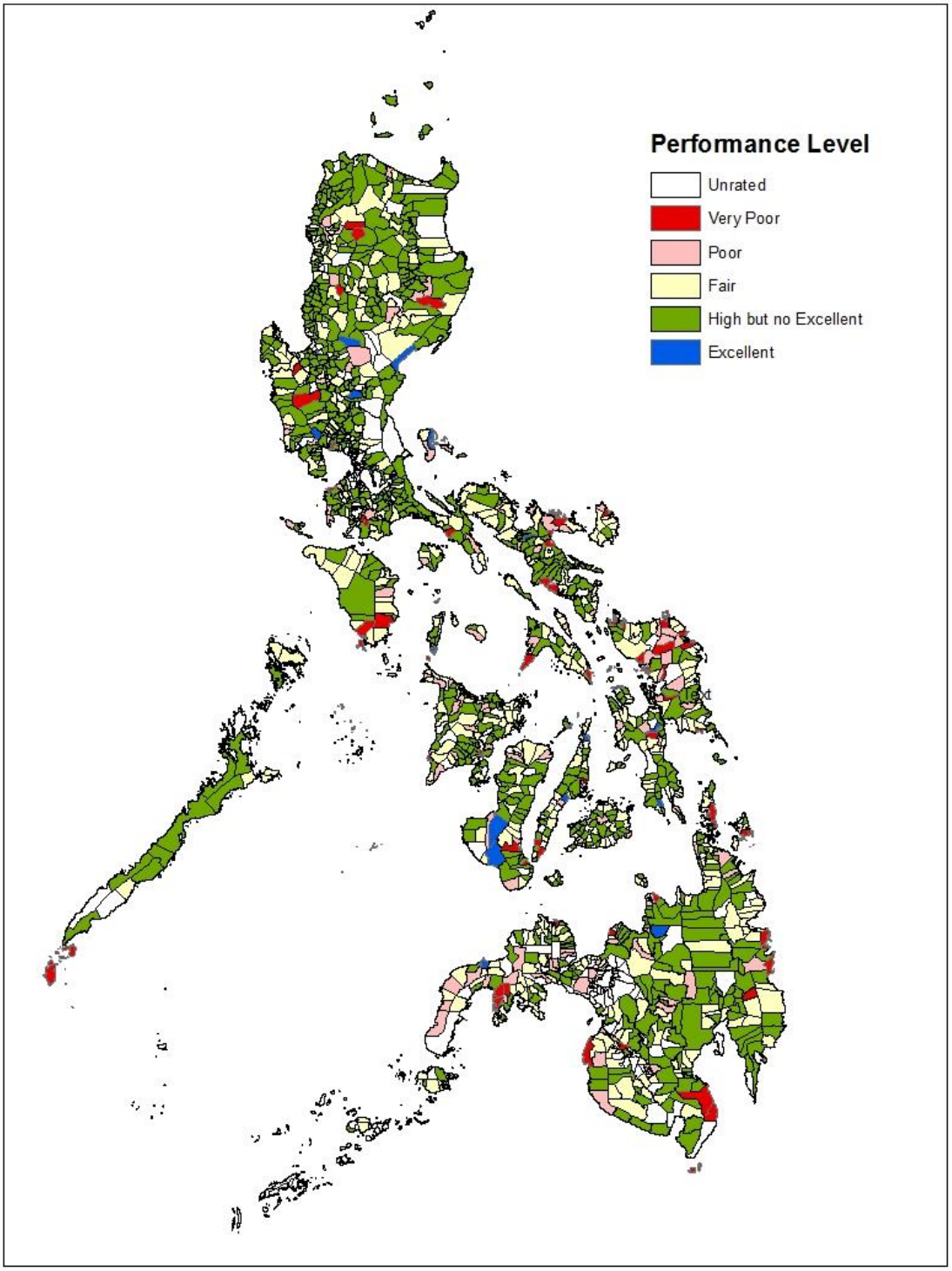

FIGURE 1.1: Agricultural service delivery performance by municipality, 2009.

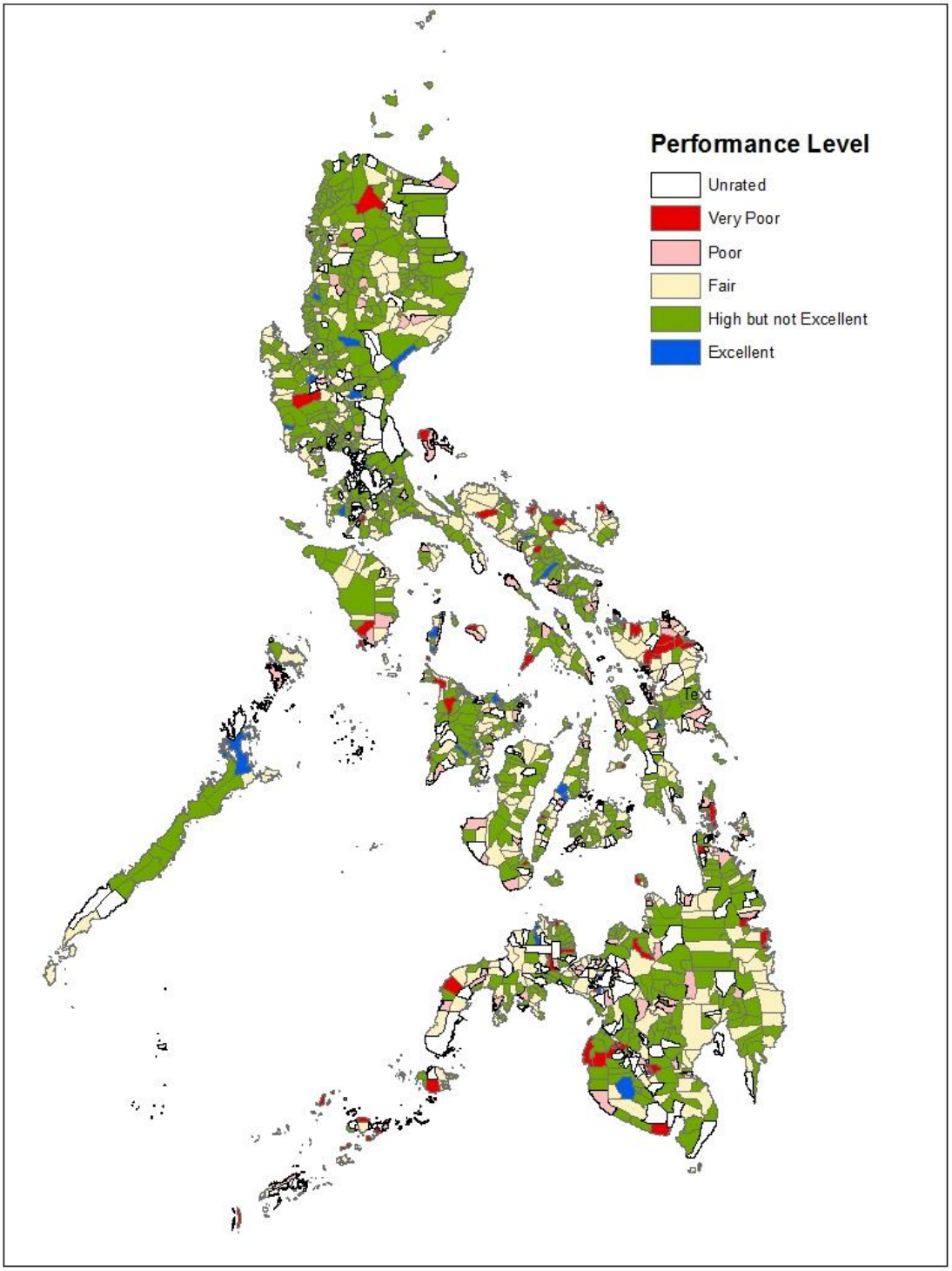

FIGURE 1.2: Agricultural service delivery performance by municipality, 2010.

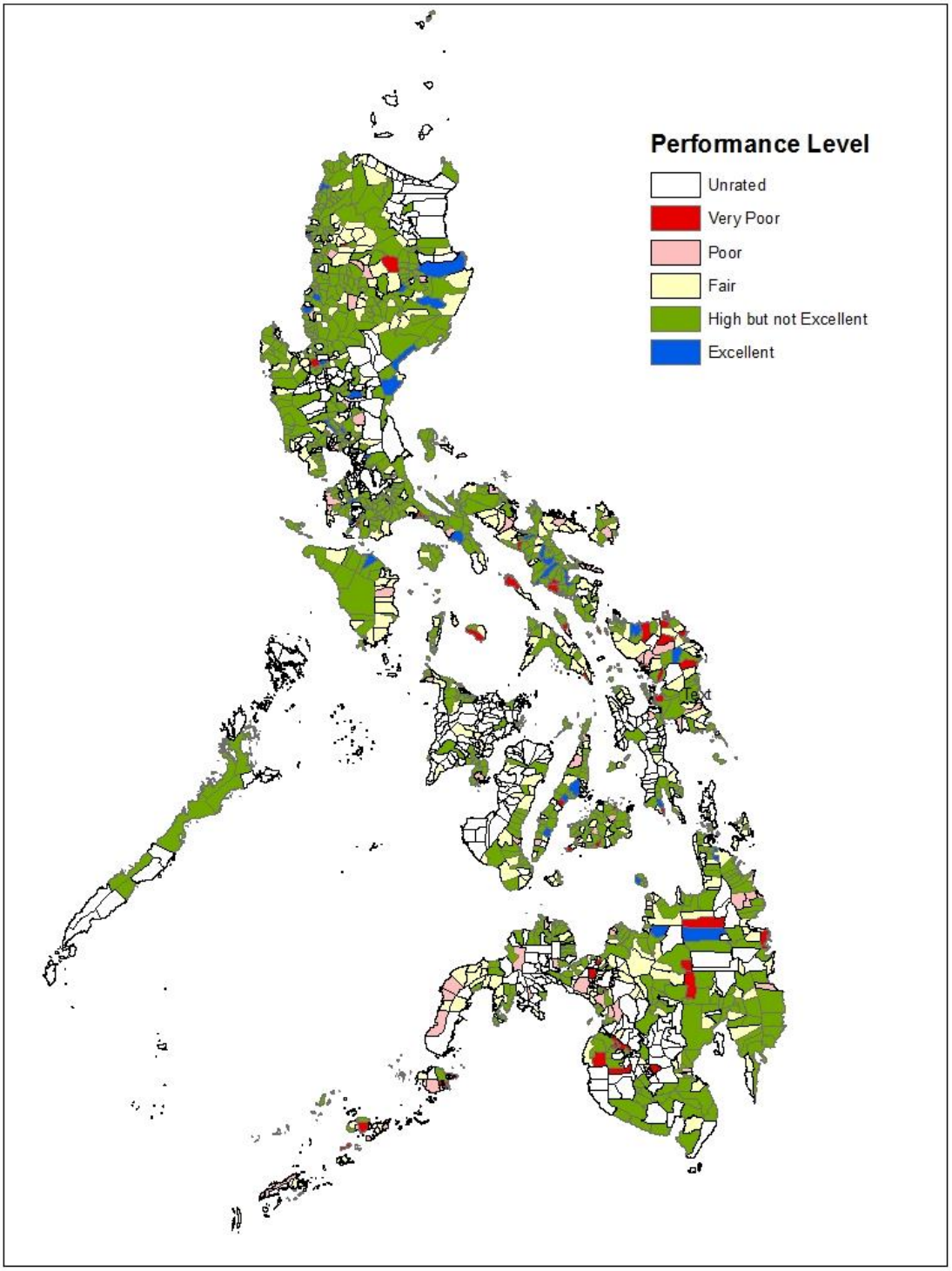

FIGURE 1.3: Agricultural service delivery performance by municipality, 2011.

1.5.2 Measures of the Explanatory Variables

To provide a general picture of rural clientele share across the country's municipalities, regional averages were computed and presented in Figure 4. Two major observations can be noted. First, the proportion of the rural constituency does not significantly fluctuate from 2009 to 2011. This trend is not surprising, given the shortness of the panel period covered. With the exception of the event of disaster (as experienced by a few provinces in the aftermath of Haiyan last year), local populations are not expected to exhibit drastic movements within a span of three years. It is hence conceptually and practically sound to assume that rural clientele share is a time-invariant variable in the model. Secondly, the proportions of rural population were generally high across the municipalities, highlighting the continued relevance of the agricultural sector in the greater areas of the country. The relatively lower averages for Regions 3 (55 percent) and 4a (57 percent) are likely attributable to urban developments that have been spilling over from adjacent metropolitan areas of the national capital region.

Table 1.2 reports of the summary statistics for rural constituency share in municipalities across the country for the years 2009 to 2011. The shares of rural constituents in the populations of cities and municipalities range from zero to 100 percent. The mean for this variable is 75 percent with a standard deviation of 26 percent. Its distribution is negatively skewed and heavy tailed (Figure 1.4). Table 1.3 shows the distribution of municipalities into five value categories for rural constituency share. While about eight percent of the municipalities have less than 20 percent of their populations living in rural areas, more than half of them have more than 80 percent rural constituency. About 30 percent of the municipalities can be classified as highly rural for

having over 90 percent rural population. On the other hand, only about 36 percent of the municipalities have rural constituency shares falling within the middle section of 20-80 percent. Supplemental visual representations of this distribution are presented in Appendix C.

TABLE 1.2: Descriptive statistics for rural clientele share (%).

Statistics	2009	2010	2011
N	1604	1603	1606
Minimum	0	0	0
Maximum	100	100	100
Mean	75.03	75.08	75.11
Standard deviation	25.72	25.66	25.71
Variance	661.62	658.51	661.03
Skewness	-1.78	-1.78	-1.78
Kurtosis	5.57	5.60	5.60

TABLE 1.3: Municipalities by share of rural population.

Proportion of	2009		2010		2011	
Rural Population	No.	%	No.	%	No.	%
<10%	114	7	113	7	114	7
<20%	124	8	123	8	124	8
20-80%	575	36	575	36	573	36
>80%	905	56	905	56	909	57
>90%	484	30	484	30	487	30
Total	1604		1603		1606	

The next set of explanatory variables considered in this study pertains to the fiscal traits of the LGU. Municipal income, the proportion of income coming from IRA transfers and the proportion of the expenditures that go to economic services spending are

summarized, along with relevant income and expenditure variables in Table 1.4. The percentile distributions of these variables are presented in Table 1.5.

Cities and municipalities are classified into several groups based on average annual incomes: six income classes for cities and another six for municipalities. The spread of this variable's distribution is extensive though more concentrated to the lower values. As presented in Table 1.4, annual municipal incomes range from PhP7.8 million to PhP4.8 billion. Average income has grown from PhP113.6 in 2009 to PhP 129.3million in 2011. In Table 1.5, three-fourths of the municipalities have incomes lying below the mean. Figure 1.5 illustrates this pattern of distribution for income.

Table 1.4 also shows that IRA generally makes up the bulk of the municipal government's income. On average, income sourced from IRA transfers is well above 80 percent. Derived from a set formula, the IRA received by a municipality is largely based on population and land area of the jurisdiction. It has become the main source of the LGU's income especially for localities with weak economic base. Although some of the LGUs report little dependence on IRA, they represent a minority as reported in Table 1.5. Figure 1.6 confirms this distribution pattern.

Economic services spending contribute to an average of 17 percent of the municipal government's expenditures (Table 1.4). The rest of the public expenditures is allotted to general services and other devolved responsibilities such as provision of support to education, health, environment, and other concerns in the locality. As can be seen in both Table 1.5 and Figure 1.7, values for this variable are positively skewed, though not as much as municipal income.

TABLE 1.4: Descriptive statistics for income and expenditure variables.

Variable	2009	2010	2011
Income (PhPmillion)			
N	1604	1603	1606
Minimum	7.81	18.70	20.16
Maximum	4005.07	4296.51	4757.82
Mean	113.61	119.65	129.29
Standard deviation	227.78	221.63	237.39
Variance	51883.38	49120.14	56355.05
Skewness	9.18	8.71	8.83
Kurtosis	122.01	117.59	125.17
IRA Share (%)			
N	1604	1603	1606
Minimum	9	11	13
Maximum	100	100	100
Mean	84	81	81
Standard deviation	14	16	15
Variance	201	250	217
Skewness	-1.71	-1.56	-1.52
Kurtosis	6.52	5.41	5.62
Expenditure (PhPmillion)			
N	1604	1603	1606
Min	6.98	14.36	15.00
Max	3440.55	4319.03	3449.29
Mean	86.65	93.27	99.51
Standard deviation	160.82	183.28	178.19
Variance	25863.12	33590.56	31753.17
Skewness	10.34	12.80	10.00
Kurtosis	165.53	243.43	153.44
Economic Services Spending Share (%)			
N	1603	1603	1606
Min	0	2	0
Max	97	77	69
Mean	16	17	17
Standard deviation	10	9	9
Variance	99	85	74
Skewness	1.93	1.50	1.20
Kurtosis	10.48	7.57	5.96

TABLE 1.5: Percentile distribution of fiscal variables, 2009-2011.

Percentile	Municipal Income (PhPmillion)	IRA Share (%)	Economic Spending Share (%)
1%	23.97	30	3
5%	31.75	50	5
10%	37.28	62	7
25%	48.64	78	10
50%	66.31	86	15
75%	100.62	93	21
90%	179.69	97	28
95%	419.45	99	34
99%	1086.20	100	46

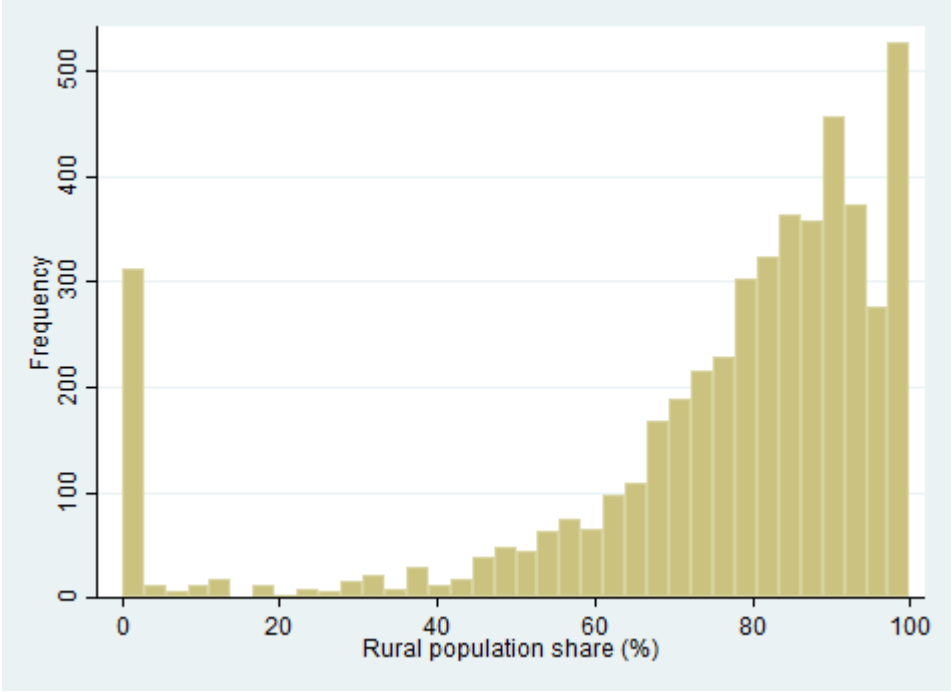

FIGURE 1.4: Distribution of municipal rural population share, 2009-2011.

The performance scores of provincial governments in agricultural service delivery were on average high (but not excellent) at 4.4. Figure 1.8 indicates that most of the municipalities belong to provinces that garnered performance scores close to this mean value. As with Table 1.1, provincial government performance scores were classified into the five performance levels and in turn became basis for the distribution of municipalities. In Table 1.6, about 86 percent of the municipalities were located in "high" and "excellent" performing provinces. Comparing the distributions in Tables 1.1 and 1.4, the number of municipalities in "excellently" performing provinces exceeds those of municipalities that are themselves performing "excellently".

TABLE 1.6: Distribution of municipalities by provincial government's agricultural support performance rating.

Performance	2009		2010		2011	
Rating	No.	%	No.	%	No.	%
Excellent	112	7	161	10	288	18
High	1156	76	1145	73	1177	73
Fair	195	13	219	14	120	7
Low	56	4	22	1	21	1
Very Low	0	0	17	1	0	0
Total	1519	100	1564	100	1606	100

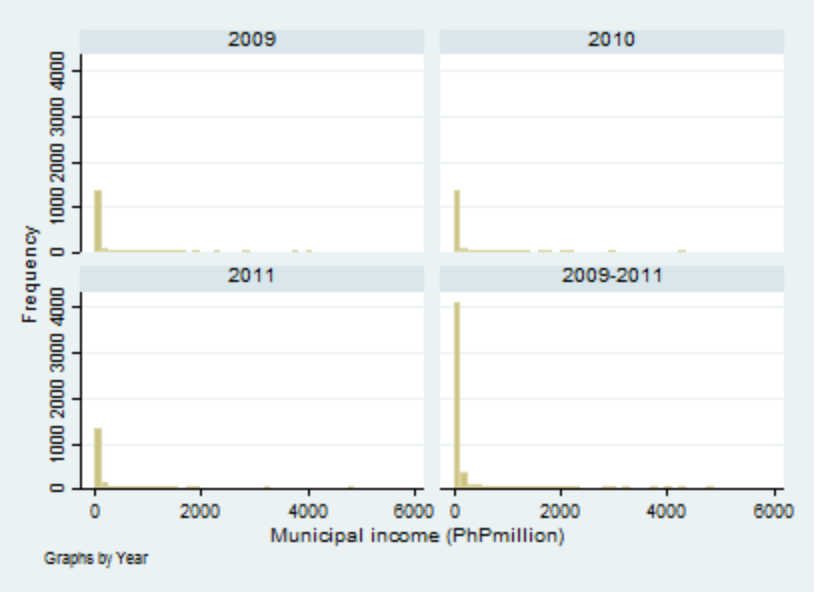

FIGURE 1.5: Distribution of municipalities by income and year.

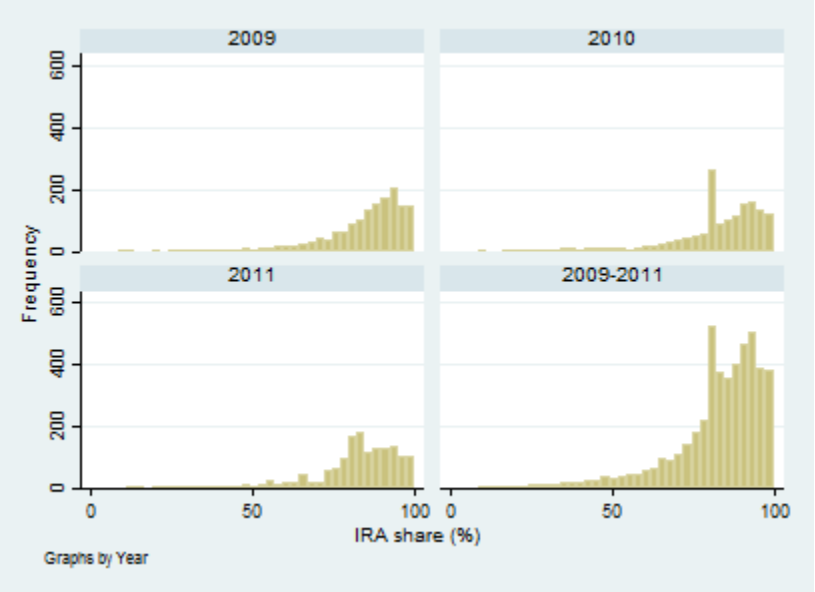

FIGURE 1.6: Distribution of municipalities by IRA share and year.

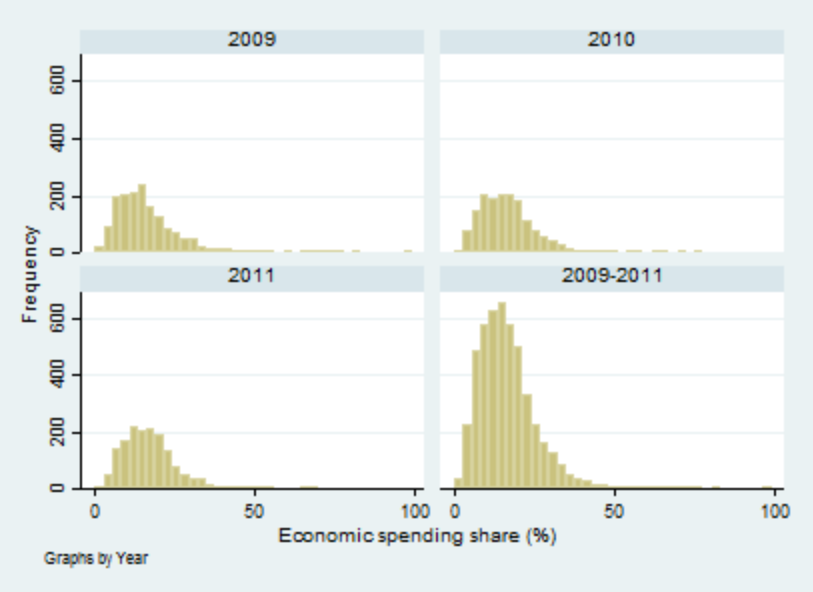

FIGURE 1.7: Distribution of municipalities by economic spending share and year.

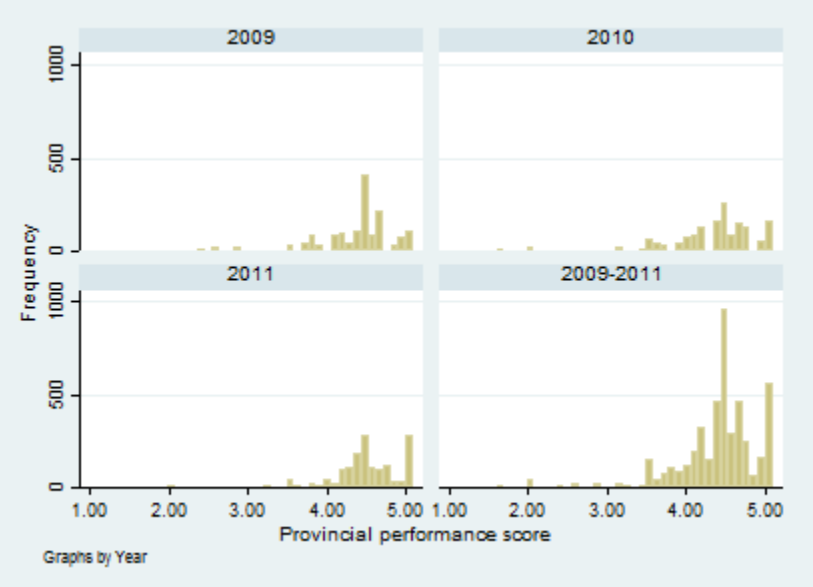

FIGURE 1.8: Distribution of municipalities by provincial performance score and year.

TABLE 1.7: Participation pattern of municipalities.

Pattern	No. of municipalities	Percent	Cumulative %
Y1-Y2-Y3	1592	98.45	98.45
Y3	13	0.80	99.26
Y1-Y2	11	0.68	99.94
Y1-Y3	1	0.06	100.00

1.5.3 Estimation Results

A total of 1617 cities and municipalities evaluated by the LGPMS from 2009 to 2011 made up the panel data set used in the estimation of the longtitudinal ordinal logistic regression model for the level of the agricultural support performance. These LGUs exclude those located in the highly urbanized national capital region. Each panel does not contain exactly the same number of observations but the imbalance was small. About 98 percent of the municipalities are represented by observations covering all three time points (Table 1.7).

Collinearity statistics reported in Table 1.8 reveal issues with the share of economic service spending and the interaction of this variable with the rural constituency share. The multicollinearity problem however subsided when centered data for the two variables were used (Table 1.9). Estimation proceeds to use centered data for economic spending share and for the interaction term of including this variable.

The parameter estimates, estimated cut-points, and the estimated panel-level variance are reported in Table 1.10. The Wald Chi-Square statistic indicates the model's significance. The estimated variance component is 2.68 with standard error of 0.22. The likelihood ratio (LR) test statistic of 521.84 indicates that at one percent alpha, there is

significant variability between municipalities to favor random-effects ordered logistic regression over the standard ordered logistic regression. Standard errors were initially calculated through the use of the default variance–covariance (VCE) matrix specification---the observed information matrix (OIM), which is based on asymptotic maximum-likelihood theory. This VCE specification assumes the errors as independent and identically distributed normal. Alternatively, the same model is estimated through the use of a VCE type that relaxes the assumption of independence of the errors and allows intra-group correlation. The clustered robust VCE specification was deemed to control for any serial correlation issues for each unique subject, particularly for fiscal variables that might be planned by a municipal government with reference to previous periods. It does not change the values of parameter estimates. It yielded marginally different error values and Wald statistic but does not significantly affect the inferences that can be derived from the model.

TABLE 1.8: Collinearity diagnostics (uncentered data).

Variable	VIF	SQRT VIF	Tolerance	R-Squared
Rural popn share (%)	4.19	2.05	0.2387	0.7613
Income (PhPmillion)	1.28	1.13	0.7809	0.2191
IRA share (%)	1.36	1.16	0.7378	0.2622
Provincial Score	1.03	1.01	0.9713	0.0287
Econ spending share (%)	8.21	2.87	0.1218	0.8782
Econ Spending * Rural	10.88	3.3	0.0919	0.9081
Mean VIF	4.49			
Condition Number	37.22			

TABLE 1.9: Collinearity diagnostics (centered data for selected variables).

Variable	VIF	SQRT VIF	Tolerance	R-Squared
Rural popn share (%)	1.30	1.14	0.7699	0.2301
Income (PhPmillion)	1.28	1.13	0.7809	0.2191
IRA share (%)	1.36	1.16	0.7378	0.2622
Provincial Score	1.03	1.01	0.9713	0.0287
Econ spending share (%)	1.02	1.01	0.9788	0.0212
Econ Spending * Rural	1.01	1.01	0.9878	0.0122
Mean VIF	1.17			
Condition Number	28.91			

Note: Economic services spending share was centered while the interaction term was computed using centered data for rural population share and economic services spending share

The coefficients in the model indicate the direction of the explanatory variables' influence on the level of agricultural support performance of the municipal government. Among the hypothesized determinants, municipal income, IRA share and the provincial government's performance score were statistically significant. In terms of odds ratios associated with these three variables, the influence of provincial government performance is noticeably greater than those of income and IRA share.

In not finding a statistically significant relationship between rural constituency share and municipal agricultural support performance, the analyses challenge the notion of a "locally-responsive" municipal government, at least in terms of delivering a higher level of agricultural support to areas perceived to have high service demand. Instead of automatically dismissing the municipal governments' responsiveness to local needs for agricultural support, this unexpected result can also point to other means by which the effect of local demand is cancelled out by characteristics associated with having a high rural constituency. Revisiting the NSCB's technical definition of a rural area, these are

communities with low population density. A low population-land area ratio can have conflicting implications for a municipality's IRA receipts. An LGU's IRA is mainly based on and positively influenced by population and geographic size of the jurisdiction. Among comparably sized municipalities in terms of land area, the more rural municipalities have fewer residents than their urban counterparts and hence, receive lower IRA transfers thereby negatively impacting the municipal income. The more rural municipalities typically have a smaller local tax base and fewer economic opportunities to generate incomes to augment IRA receipts. Municipalities with a greater share of rural population are therefore associated with lower municipal government income and higher dependence on IRA. The pairwise correlations of the explanatory variables in Table 1.11 indicate these relationships.

TABLE 1.10: Random effects ordinal logistic estimates, 2009-2011.

Explanatory Variables	Coeff	se	Robust se	Odds Ratio
Rural Population Share (%)	-0.002	0.002	0.002	0.998
Gross Income(PhPmillion)	0.001	0.000	0.000	1.001 ***
IRA-Share(%)	-0.029	0.004	0.004	0.972 ***
Provincial Performance	0.476	0.077	0.084	1.609 ***
Econ Spending Share (%)	0.001	0.005	0.005	1.001
Econ Spending * Rural	0.000	0.000	0.000	1.000
cut1	-4.600	0.502	0.666 ***	
cut2	-3.092	0.497	0.658 ***	
cut3	-0.558	0.494	0.655	
cut4	5.201	0.510	0.669 ***	
Wald chi2(6)	186.84 ***		149.04 ***	
sigma2 u	2.68		2.68	
	(0.22)		(0.24)	
chibar2(01)	521.84 ***			
No. of groups	1611			
N	4631			

Note: ***p ≤ 0.01

TABLE 1.11: Means and correlation matrix for covariates, 2009-2011.

Variable	1	2	3	4	5
1 Rural popn share (%)	1.000				
2 Income (PhPmillion)	-0.379 ***	1.000			
3 IRA share (%)	0.407 ***	-0.401 ***	1.000		
4 Econ spending share (%)	-0.024	0.068 ***	-0.108 ***	1.000	
5 Provincial Score	-0.101 ***	0.058 ***	-0.155 ***	-0.005	1.000

Note: ***p ≤ 0.01

A preliminary bivariate analysis, rural constituency share was found to significantly affect the municipal government's agricultural support performance. However, the addition to the model of municipal income and IRA share resulted to the loss of that significant relationship, suggesting a mediating role of rural constituency share. In this case, the use of rural constituency share to represent perceivable agricultural services demand can muddle the examination of causality between local demand and agricultural support performance.

The parameter estimates in Table 10 provides support for the positive influence of municipal income on agricultural support performance. Holding other variables constant, increases in the municipal government's gross income improves its ordered log-odds of being at a higher performance level in the delivery of agricultural services. For a million peso increase in the municipal government's gross income, the odds of earning an "excellent" rating over the any of the 'lower' ratings is 1.001 times greater. Likewise, the same increase in gross income results in the odds of earning either "high" or "excellent" rating being greater by 1.001 times over the any of the lower ratings. Based on the model's estimate and those of exploratory estimations that tested the influence of larger unit transformations of income, the income-effect on performance is rather small.

The model also shows that a higher proportion of the IRA-sourced municipal government income decreases the ordered log-odds of obtaining a higher performance rating. The parameter estimate indicates that each percent increase in IRA share significantly decreases the odds of higher performance level by 0.972 times. As with income, however, this impact is quite small.

On the other hand, the ordered log-odds of a higher level of municipal performance in agricultural support improves with an improvement in the provincial government's performance. A full unit increase in the provincial government's score, improves the odds of higher performance level by 1.609 times for the municipal government. This result points to the relevance of the provincial government's own stance and efforts toward effective delivery of agricultural services. Being the more powerful and larger government unit, the provincial government is well able to encourage, guide, and even materially supplement municipal governments' efforts to delivery services to the local agricultural sector.

The effect of economic services spending share and its interaction with the rural constituency share were not statistically significant in the model. These results may be due to the unremarkable share of economic services spending in the municipal budget. There might even be greater difficulty to attribute municipal performance to agriculture-related development spending as it is an even smaller piece of the pie.

To further look how rural clientele share might be associated with the municipal government's performance of agricultural service delivery, the agricultural support performance model was estimated for three municipality groups based on the share of rural population. These models represent municipalities with less than ten percent rural

constituents (highly urban), those more with than 90 percent rural population (highly rural), and those in between. The estimates in Table 1.12 indicate consistent directions of influence by the municipal revenues, IRA share and provincial performance scores across the groups. It can also be noted that the magnitude of influence of the provincial government's performance is qualitatively different for the extreme groups of municipalities, as evidenced by greater magnitude of effect for highly urban and highly rural municipalities. On the other hand, the magnitudes of influence for municipal income and IRA dependence were only marginally different across the three municipality groups.

Ordered logistic regression assumes that the coefficients describing the relationship between all pairs of ordered response categories are the same. The odds ratios estimated here are cumulative odds of belonging to one category and those under it versus those of all other higher categories. This proportional odds or parallel regression assumption needs to be checked for validity in order to determine whether a more flexible model is required. If this assumption is violated, then the odds ratios should not be the same for all ordered response pairs. Since Stata does not have diagnostic tools directly applicable to ordered logistic panel models, this assumption was tested by first running ordered logistic regression without taking account of the panel nature of the data so that a Brant test can be employed.

Results presented in Table 1.13 indicate that the parallel regression assumption was violated for the income, provincial performance and economic service spending, at the five percent level of significance. To address such issue, random effects logit models for each of the performance levels were estimated. This was done in consideration of the variability across municipalities that can be controlled for in a panel regression model.

The estimates, which are presented in Table 1.14, show the influence of independent variables on the odds of a municipality earning that particular level of agricultural support performance. Across the models, the influence of the provincial government's performance was consistent and remarkable for the two lowest performance levels as we ll as for the high performance level. However, its effect was very small for the odds of earning a "fair" rating and insignificant for "excellent" performance. The influence of income was significant (though small) only in the lowest two performance ratings. The IRA share also exhibited consistent though small effects on the odds of earning any of the four higher performance ratings. Economic spending share was found to have significant positive influence on the odds of an excellent performance rating. These findings suggest careful interpretation of the independent variables influence on municipal performance.

As a final consideration following the failure to find support for the influence of rural constituency share in the random effects estimation of agricultural support performance, a Hausman test was conducted for the linear panel estimation of fixed and random effects models. This is to revisit the appropriateness of the random effects model visavis fixed effects, when the influence of the time-invariant rural constituency share is ignored. Results of this test (Table 1.15) reveal the sufficiency of fixed effects estimation in this scenario. However, the estimation of a fixed-effects ordered logit model that is comparable to the random effects model in Table 1.10 is more complex than its alternative. Introduction of municipality dummies to arrive at the same result did not work due to the shortness of the panel. In order to make relevant inference, a fixed-effects linear model was estimated. It is reported alongside with a random-effects counterpart for comparison (Table 1.16). Results show that a fixed-effects estimation

does not provide support for the influence of IRA-share on performance. The improvement in this variable's significance is improved by accounting for rural constituency share, to which it is positively correlated (Table 1.11).

TABLE 1.12: Ordinal logistic estimates, by municipality group, 2009-2011.

Explanatory Variables	DV: Agricultural Support Performance Level		
	<10% Rural	10-90% Rural	>90% Rural
	Odds Ratio	Odds Ratio	Odds Ratio
Municipal Revenues	1.001 **	1.001 **	1.006 ***
	(0.000)	(0.001)	(0.002)
IRA-Share	0.986	0.970 ***	0.975 ***
	(0.018)	(0.005)	(0.007)
Provincial Performance Score	2.509 **	1.370 ***	2.069 ***
	(1.173)	(0.140)	(0.313)
Econ Spending Share	1.095	0.999	1.060
	(0.781)	(0.006)	(0.056)
Econ Spending * Rural	1.001	1.000	0.997
	(0.010)	(0.000)	(0.002)
cut1	-1.406	-5.313 ***	-2.600 ***
	(2.697)	(0.669)	(0.984)
cut2	-0.066	-3.794 ***	-1.079
	(2.689)	(0.661)	(0.972)
cut3	2.384	-1.222	1.378
	(2.718)	(0.656)	(0.964)
cut4	8.160 ***	4.557 ***	7.112 ***
	(2.820)	(0.677)	(1.001)
Wald chi2(4)	21.68 ***	73.92 ***	55.20 ***
sigma2 u	3.88	2.48	2.62
	(1.50)	(0.28)	(0.44)
No. of groups	109	1012	490
N	306	2928	1397

Notes:
***p ≤ 0.01 ; ** p ≤ 0.05
Robust standard errors in the parentheses

TABLE 1.13: Test of the parallel regression assumption.

	Ologit model (2009-2011)			Brant test		
Explanatory Variable	Odds Ratio		Robust se	chi2	p>chi2	df
Rural Population Share (%	0.999		0.002	3.27	0.351	3
Income (PhPmillion)	1.001	***	0.000	10.64	0.014	3
IRA-Share(%)	0.974	***	0.003	7.05	0.070	3
Provincial Performance	1.554	***	0.105	21.78	0.000	3
Econ Spending Share (%)	1.004		0.004	8.49	0.037	3
Econ Spending * Rural	1.000		0.000	1.78	0.620	3
ALL				49.90	0.000	18
cut1	-3.410		0.456			
cut2	-2.228		0.447			
cut3	-0.427		0.443			
cut4	4.015		0.448			
Wald chi2(6)	192.12	***				
Pseudo R2	0.0340					
N	4631					

Note: ***p ≤ 0.01

TABLE 1.14: Random effects logit models by performance category, 2009-2011.

	Very Low		Low		Fair		High		Excellent	
Explanatory Variables	Odds ratio	Robust se	Odds ratio	Robust se	Odds ratio	Robust se	Odds ratio	Robust se	Odds ratio	Robust se
Rural Population Share (%)	1.002	0.006	0.998	0.003	1.001	0.002	1.001	0.002	0.991	0.006
Income (PhPmillion)	0.997	0.002 **	0.997	0.001 **	0.999	0.000	1.000	0.000	1.001	0.000 **
IRA-Share(%)	1.015	0.010	1.037	0.008 ***	1.019	0.004 ***	0.972	0.004 ***	0.980	0.009 **
Provincial Performance	0.399	0.057 ***	0.714	0.076 ***	1.001	0.078	1.464	0.132 ***	1.532	0.491
Econ Spending Share (%)	0.981	0.012	1.007	0.008	0.999	0.004	0.996	0.005	1.034	0.013 ***
Econ Spending * Rural	1.001	0.001	1.000	0.000	1.000	0.000	1.000	0.000	1.000	0.000
constant	0.220	0.274	0.015	0.013 ***	0.089	0.046 ***	1.958	1.092	0.002	0.004 ***
Wald chi2(6)	66.05 ***		68.67 ***		59.04 ***		105.56 ***		27.52 ***	
lnsig2u	1.11	0.20	0.43	0.21	0.14	0.13	0.90	0.10	1.66	0.30
sigma_u	1.74	0.18	1.24	0.13	1.07	0.07	1.57	0.08	2.29	0.34
rho	0.48	0.05	0.32	0.046	0.26	0.03	0.43	0.02	0.61	0.07
N	4688									
No. of groups	1617									

Note: ***p ≤ 0.01 ; ** p ≤ 0.05

TABLE 1.15: Hausman test results.

Independent Variables	Coefficients Fixed (b)	Random (B)	Diff (b-B)	s.e. sqrt(diag(V_b-V_B))
Income (PhPmillion)	0.001	0.000	0.001	0.000
IRA share (%)	0.000	-0.007	0.007	0.001
Econ Spending Share	0.000	0.002	-0.002	
Provincial Performance Score	0.077	0.168	-0.091	0.017
chi2(5)	50.30			
Prob>chi2	0.000			

TABLE 1.16: Panel estimates for agricultural services spending per capita, 2009-2011.

Explanatory Variables	Fixed Effects Coefficient		Robust se	Random Effects (GLS) Coefficient		Robust se
Rural population share (%)				-0.001		0.001
Gross Income (PhPmillion)	0.001	***	0.000	0.000	***	0.000
IRA-Share (%)	0.000		0.002	-0.007	***	0.001
Provincial Performance Score	0.077	**	0.036	0.168	***	0.030
Econ Spending Share (%)	0.000		0.002	0.002		0.004
Econ Spending*Rural				0.000		0.000
Constant	2.978	***	0.230	3.253	***	0.201
F(4,1610)	3.550	***				
Wald chi2(6)				165.83	***	
sigma_u	0.671			0.515		
sigma_e	0.640			0.640		
rho	0.524			0.393		

Note: ***p < 0.01
** p < 0.05

1.6 Discussion and Conclusion

Results of the analyses provide support for the expected influence of income, IRA-dependence and provincial government performance on the municipal government's performance of its devolved responsibility of agricultural service delivery. On the other hand, the hypothesized effect of the rural clientele's size was not supported by the regression estimates be it in the ordered logistic panel model or in the set of panel logit estimations. However, rural constituency share, in terms of its extreme values, revealed qualitative difference in the odds ratio estimates for provincial performance. These estimates were observed to be substantially higher for the highly urban and highly rural municipality groups. Results of the panel logit estimations also reveal that while the direction of influence were consistent for income, IRA share and provincial government performance, the effects of these variables are not significant for all performance levels. Economic spending share, which was not found to be significant in the ordered logit estimations was found to have a significant positive influence on the odds of attaining an excellent performance rating. The following discussion reflects on the logic and implications of these results

In verifying the second hypothesis, the results underline the value of fiscal adequacy in effectively providing relevant agricultural services (Howell, 1985; Feder, Willet &Zijp, 2001; Anderson & Feder, 2003). Considering that the municipal government actually has to allocate its financial resources toward a number of other service responsibilities, income even modestly enhancing the performance of agricultural support serves to stress the point that "a bigger pie" is a crucial ingredient to effective service delivery. Providing and more importantly, sustaining the delivery of quality

support services entails ensuring that municipal governments have the necessary financial resources to expend. One more thing that could be picked up from the panel logit estimates in Table 1.14 is that a unit increase in municipal income significantly reduces the odds of ending up with a low or very low performance rating.

Since not all municipalities are on equal footing in terms of locally generating needed funds, IRA has been seen as an equalizing mechanism to enable local governments to meet the corresponding service needs of their constituencies. Financial transfers from the central government like the IRA seem to be the convenient solution to address local agricultural support needs. However, results that validate the third hypothesis further qualify the convenience argument for stimulating the impact of municipal government incomes on the level agricultural support performance through IRAs. While IRAs directly increase the municipal government's financial resources for service delivery, heavy dependence on these transfers has adverse effects on the service delivery performance of the municipal government. A high proportion of IRA-sourced income indicates the local government's limited capacity to generate income from other sources. On one hand, it may just be that limited capacity is a result of a weak economic base from which little local revenues can be drawn. On the other hand, this tendency also says something about the fiscal management capacity of the local government, particularly in working around the limitations of a weak economic base. In the latter, IRA dependence serves to signal a broader measure of local government management capacity that ultimately determines the quality of its support to the agricultural sector. These findings emphasize the relevance of further strengthening municipal government capacity to address both fiscal and service delivery concerns.

The influence of the provincial government's performance was also found to significantly improve the odds of higher performance of agricultural support. While the municipal government does have autonomy from the provincial government in determining its local service delivery strategies, the latter has some supervisory or oversight powers over the former. More importantly, there exists a close coordination and partnership relationship between the two levels of local government. For instance, the municipal agricultural officers are typically in regular communication with the office of the provincial agriculturist, which organizes consultative meetings and trainings for their municipal counterparts. The provincial government has greater material and human resources to pursue projects that involve and benefit the service objectives of municipal governments. It is hence not surprising that being under a higher performing provincial government tends to improve the performance of the municipal government in agricultural service delivery. Additionally, the notably larger odds ratios for provincial government performance in both the highly urban and rural municipality groups suggest that where agricultural is clearly the less significant sector, municipal performance of agricultural support reacts more to provincial government's service delivery efforts. Ironically and perhaps due to relatively more limited resources for the typically lower income, highly rural municipalities, agricultural support performance similarly responds more to the initiatives and activities of the provincial government.

As discussed in the previous section, the failure of the estimations to provide support for the direct influence of the rural clientele share on agricultural support performance can be attributed to its close association with IRA receipts and municipal income. A formula-based determination of IRA transfers basically ties in demographic

and geographic characteristics of the more rural municipalities to the amount of resources available to the municipal government for the conduct of its service responsibilities. As long as this is the case, rural constituency share cannot capture the local demand for agricultural services and be used as determinant of agricultural support performance. The effects of IRA and income will keep muddling any demand influence that rural constituency can represent.

Results of the estimations in Table 1.14 qualify the hypothesized the influence of economic spending share on agricultural support performance as significant only when it comes to the odds of earning an "excellent" rating. This effect is modest though suggestive of the potential influence of targeted sector spending on service delivery performance. In retrospect, the use of economic spending share as a determinant of agricultural support performance is a bit of a stretch considering that agricultural service spending is only one component of the economic services portfolio. Unfortunately, obtaining a more detailed breakdown of municipal economic services expenditures that identifies agricultural support spending for all municipalities in this study would take more time than what is already feasible for this dissertation project. The following essay looks further into the municipal fiscal spending for agricultural support in one of the provinces in the Philippines, with the objective of identifying its determinants.

In summary, results of the analyses highlight the enduring theme of organizational capacity building for municipal governments as it applies to promotion of effective local agricultural service delivery. The strength of decentralized service delivery is mainly in LGUs' advantage in ascertaining demand and consequently tailor-fitting the supply of support services to local needs. Such "demand-side" advantage of these LGUs is

undermined as municipal governments in the highly rural areas coincidentally tend to have fewer resources for service provision. Where resources or service priority (as in the case of highly urban municipalities) are low, the role of the provincial government in the delivery of agricultural support is crucial to successes at the municipal level.

1.7 Implications for Policy and Practice

Results of the analyses suggest that agricultural support performance is significantly driven by the municipal government's resources, fiscal management capacity, and its provincial government's performance. This section explores a few policy and practice implications of these findings.

Improvements in incomes provide municipal governments with greater flexibility to expand funding toward activities and projects that enhance its agricultural support performance. The impact of this variable is understandably small as incremental increases in the municipal resources are in turn allocated into various spending priorities, one of which is economic services. Since this expenditure category comprises only about 17 percent of the municipal spending, agricultural services spending is expected to be less than this amount. The following essay shows that this share can be substantially lower.

Adjustments in the computational formula for determining IRA transfers seem to be a straightforward response to the resource needs of devolved agricultural service delivery. The task is politically and technically daunting as the challenge lies in proposing an alternative scheme that accommodates other points of disparities among localities. The LGC already has in place a provision that requires municipal governments to allocate 20 percent of their annual spending to local development activities. Still, this requirement does not necessarily get channeled toward agricultural services delivery. If

municipal agricultural support is to be boosted with infusion of resources into the LGU, a targeted grant is a viable alternative to merely relying on IRA increases.

Increasing locally generated incomes can also aid the resource requirements of improved agricultural support performance. Unfortunately, most of the lower income and more rural municipalities were also observed to depend heavily on IRAs. The issue points to the need to boost the fiscal management capacity of these LGUs so they can improve their incomes with gradually decreasing dependence on IRAs. This enables greater flexibility to make allocations that enhance the local economic base which, in the case of rural municipalities implies greater allocations toward agricultural support.

Municipal governments have also been adopting alternative provision schemes such as partnerships and coordination with various sectors in society. For example, Van den Ban and Samanta (2006) observe from Asian countries the growing trend of extension delivery conducted under pluralistic institutional arrangements, that is, with significant involvement of farmer groups, non-government organizations (NGOs), and the private sector. As found results of the analyses imply, maintaining close partnership with the provincial government is important to performance. The provision of services that the municipal government could otherwise not afford through its limited resources can otherwise be provided through partnership and coordination with the larger provincial government. Furthermore, the municipal government can look into strengthening its linkage with national government agencies, which offer the needed capacity and technical support for local agricultural service delivery.

Results suggest that for highly rural municipalities that are encumbered by relatively greater resource and capacity limitations, agricultural service delivery

performance is contingent on the corresponding performance of the provincial government. Strengthening the provincial government's capacity to provide support to the agricultural sector is hence expedient to the promotion of effective municipal agricultural service delivery, particularly for highly rural municipalities. However, inasmuch as provincial governments have the benefit of greater organizational size and capacity, municipal governments are deemed better able to gain knowledge of local demands (Azfar, Gurgur, Kahkonen, Lanyi and Meagher, 2000) than the higher-tiered LGU. Building agricultural service delivery capacity of highly rural municipalities should therefore be an ultimate goal if the comparative advantage of these LGUs in being more aware of local preferences can be exploited for improved agricultural service delivery.

1.8 Caveats and Future Work

A few notes of clarification and future research implications are in order. First, this study has largely focused on rural clientele share as an approximation of agricultural service demand. The application of this concept as an objective measure of local service demand encountered issues with regard to impact attribution. For one, rural constituency share appears to be intertwined with other variables that also affect performance, such as IRA dependence and municipal income. Alternative measures of local service demand that do not have the baggage of being correlated with other determinants of performance will be explored in a follow-up study. Municipal-level survey of farming households that directly identify local service needs from the rural constituency is a possible measurement strategy. Such an effort can be resource-intensive but nevertheless a promising alternative for research that is focused on local government responsiveness to service demands.

Secondly, local government performance analyzed in this study is anchored to the measurement applied by the LGPMS. These municipal performance scores are aggregated ratings from categorical self-assessments of LGUs based on several criteria (see Appendix B). Aggregated scores however do not provide information about particular service area strengths that differentiate one municipal government's performance from another. Analysis of service delivery performance in terms of these criteria of performance will be the subject of a later inquiry.

Thirdly, this study recognizes that inclusion of a few other variables would have contributed significant insights into municipal performance. Political determinants were not included in this study mainly due to limitations in time to consolidate nationwide information about voting statistics and mayoral incumbency, which could have been examined as determinant of the variations across the municipalities. Additionally, consideration of lagged effects of income and provincial performance could shed light into possible endogeneity issues.

The patterns of municipal government performance also appeal to benchmarking, both for excellent performers and the poor performers. Such inquiry could shed light into the municipal characteristics that are associated with excellent agricultural service delivery---traits that could benefit the less-performing LGUs. At the same time, a closer look into the poorly performing municipalities can aid the understanding of organizational and other support interventions that may be lacking. Assuming that the LGPMS assessments become more institutionalized into the local government system, movements across performance levels over time can also be valuable inputs to dynamic benchmarking efforts.

CHAPTER 2: LOCAL FACTORS AND NEIGHBOR EFFECTS ON AGRICULTURAL SUPPORT SPENDING: THE CASE OF MUNICIPALITIES IN BOHOL, PHILIPPINES

2.1 Introduction

The fiscal decentralization reforms that came along with devolution under the 1991 Local Government Code have essentially given municipal government greater autonomy in determining the allocation of its own spending. Given expanded income-generation powers and Internal Revenue Allotments (IRAs), these local government units (LGUs) also have the authority to manage public resources toward the pursuit of development goals that they deem as the locality's main concern. All such reforms correspond to the argument that decentralization gives way to more locally responsive service delivery (Oates, 1993; Wallis & Oates, 1988). In the countryside where agriculture remains as a major sector in the municipalities, spending toward extension and research activities, that is agricultural service delivery, is arguably the most relevant among the expenditure allocation choices that municipal governments make. A municipal government's fiscal allocation for the administrative structure and local activities aimed at agricultural service delivery indicate the extent of its commitment to the devolved role of providing support to the sector. Notwithstanding the expansion of the IRA, these supplementary resource transfers from the central government were perceived incommensurate to the additional responsibilities LGUs have to carry (Brilliantes, 1998; Cuaresma & Ilago, 1996). With a tight budget constraint and the many competing local

needs faced by municipal governments, agricultural support expenditures all the more become more meaningful reflections of their thrust in promoting rural development. It should not be surprising if agricultural expenditures do not comprise a major chunk of the municipal fiscal allocations. Even in the case of Bolivia, agricultural spending is a low priority vis-à-vis other basic needs served by the local government (Faguet, 2004). As noted above, the pie must be divided into various devolved services and in some cases certain public goods like social welfare or health services might have to take larger slices. The previous essay suggests this tendency as it reveals that the share of spending for economic services, which is inclusive of support services to the agricultural sector, averaged only about 17 percent of municipalities' over-all expenditures. In the absence of a detailed breakdown of economic services expenditures, agricultural support spending would likely make up less of that proportion on account of competing economic sectors in the locality. Such approximation of agricultural spending in terms of the bundled value of economic services expenditure may be an overstretch but it is also arguably the most expedient, given the structure of data used.

The scholarship on local government fiscal behavior in the Philippines has been typically limited to the use of information from broad fiscal spending categories (Capuno, et al., 2012; Manasan, 2009; World Bank & ADB, 2005; Loehr & Manasan, 1999; Manasan, 1997). Without discounting the interpretive value of broad expenditure categories such as general, social and economic services spending, such structure of fiscal data provides little information about specific devolved responsibilities that matter more to one locality than another. Fiscal behavior toward local agricultural support receives very little attention in the scholarship despite the sector being significant source of

livelihood in the countryside. Clearly, economic services spending needs to be further broken down to indicate sector-specific allocations in order to explore this overlooked fiscal allocation item. This study addresses such concern by looking into local government spending directed at agricultural service delivery. Focusing on the province of Bohol for the breakdown of municipal expenditures toward agricultural support, it investigates the influence of neighbor-effects on municipal agricultural support spending, along with local factors.

This study draws from several strands of public policy and administration research as it looks into the determinants of local public spending for agricultural support. Policy process studies that model policy actions offer some illumination to fiscal expenditure as a governance choice (Keiser & Meier, 1996; May,1992; Schneider & Ingram, 1993; Ostrom, 2007). At the same time, there is a wealth of research on local public spending that tackle the influence of various factors such as organizational structure (Coate & Knight, 2009; Morgan & Watson, 1995;Jung, 2006; Sass,1991), political factors (Gerber& Hopkins, 2011; Veiga & Veiga, 2004; Foucault, Madies, & Paty, 2008), interrelatedness of fiscal choices (Case, Hines & Rosen,1993; Frère, Leprince & Paty,2012), and the external influence of higher-level government units (Aronsson, Lundberg & Wikström, 2000; Turnbull & Djoundourian , 1993; Gerber& Hopkins, 2011). The underlying theories in these studies have yet to be extended to sector-specific fiscal allocations, particularly for local agricultural support spending. This study hence explores another aspect of devolved agricultural service delivery as it investigates the local and external determinants of municipal agricultural spending.

By investigating the factors influencing agricultural spending allocations at the municipal level, this study stands to contribute valuable insights that could help in the understanding and improvement of resource mobilization toward local agricultural sector support. It also eliminates attribution issues encountered in the preceding essay by isolating expenditure allocation for agricultural services and using this more direct measure as determinant of agricultural support performance. Its focus on the less researched agricultural component of local government spending is a distinct take on local fiscal behavior and one that befits the context of most municipalities in the Philippine countryside.

2.2 Related Literature

Agricultural support expenditure is considered here as simply a subset of the total municipal expenditure. Although the values for this variable can be exclusively interpreted for just one type of public good delivered by the LGU, it is nevertheless a fiscal spending choice. Understanding of municipal agricultural spending can hence benefit from the insights offered by theoretical reasoning and empirical evidence in the policy and administration literature.

Since fiscal expenditure is in itself a type of governance action, the policy process scholarship imparts insights about public choice determinants that could be applied to municipal agricultural expenditure choice. For instance, Keiser and Meier (1996) explore the influence of resources, bureaucratic values, local variation in need for services, fiscal incentives, client characteristics and party competition on the levels of policy implementation. In policy design studies, the political environment and public officials' perception of target populations are considered as shapers of policy agenda (May,1992;

Schneider & Ingram, 1993). The Institutional Analysis and Development (IAD) framework also enlightens research on this subject through its focus on the effect of choice rules and incentives on policy choice (Ostrom, 20007). Under the IAD framework, the Rational Choice Model (RCM) depicts policy decision makers as bounded rational individuals who make benefit-maximizing choices based on incentives and available information. RCM lays down the ground for the examination of a number of factors deemed to explain local government choice such as its expenditure levels and allocations for agricultural support.

The body of research on public spending has looked into the various factors influencing local government expenditure. Comparative studies of American municipalities consider the influence of the local government's structure on public spending levels (Coate & Knight, 2009; Morgan & Watson, 1995;Jung, 2006; Sass,1991). Coate and Knight (2009) provide evidence for the argument that public spending is lower under mayor-council than a council-manager form of government while Morgan and Watson (1995) find the influence of government structure to be small and showing likelihood of effectiveness in localities that have partisan ballots. The other two studies are particular in qualifying their results according to functional scope of the expenditure. Jung (2006) verifies that public spending significantly differs between mayor-council and council-manager forms of government at the two narrowest common municipal functions. Sass (1991) comes up with a similar result for municipal expenditures for schools when government structure is considered exogenous.

Other studies on local public spending regard the influence on public spending of political factors like partisanship (Gerber& Hopkins, 2011) and opportunistic behavior of

local officials (Veiga & Veiga, 2004; Foucault, Madies, & Paty, 2008). Gerber & Hopkins (2011) find the party affiliation of the mayors affect public expenditure allocations for policy areas where local discretion is high. On the other hand, Veiga and Veiga (2007) ascertain how expenditures of Portuguese municipalities increase during pre-election periods, particularly for infrastructure expenditures which are most visible to voters. Foucault, Madies, & Paty (2008) confirm the same tendencies in French municipalities as spending for all categories increase in pre-electoral periods. Additionally, they delve into the effects of mayors' party affiliations in the existence of expenditure interdependencies among local governments.

Another strand of related research explores the external influence of other governments to the local government's fiscal choices. The literature investigates interdependencies among neighboring local governments (Case, Hines & Rosen,1993; Frère, Leprince & Paty,2012) as well as between the local government and other government levels (Aronsson, Lundberg & Wikström, 2000; Turnbull & Djoundourian , 1993; Gerber& Hopkins, 2011). Case, Hines and Rosen (1993) explain this spending interdependency as a result of efficiency-optimizing adjustments to a neighboring municipality's activities. They argue that, on account of spillovers, the expenditures of neighboring governments become an important determinant of state and local government expenditures. However, in the case of French municipalities, Frère,Leprince and Paty (2012) do not find significant impact of interdependencies within inter-municipal cooperation arrangements. . On the other hand, Aronsson, Lundberg and Wikström (2000) validate the relation between regional and municipal government expenditures in Sweden, pointing to vertical interaction in the public sector. Turnbull and

Djoundourian (1993) find a complementary relationship between county and city general expenditures as public sector expansion effects at the county level are reinforced by greater municipal spending.

As a relatively young democracy, the Philippines can also be expected to exhibit economic and political characteristics identified with other public spending determinants proposed in the literature. This study extends some of the existing fiscal spending theories to the municipalities in the study area. However, there are aspects of the Philippine context that limit and reinforce the applicability of some of the determinants in the above-mentioned studies. For instance, the uniform establishment of the mayor-council governments across municipalities in the country renders the influence of organizational structure on spending levels irrelevant. The mayor playing a central role in both administrative and policy decision making underpins the significance of his or her political incentives to expenditure levels and allocations of the municipal government. Finally, fiscal interdependence among neighboring local governments in the country has yet to be explored and a research effort to this end could provide insights that can guide possible coordination of fiscal planning among LGUs.

The studies discussed above direct attention to the functional scope of the expenditure as a fundamental component of meaningful comparisons of municipal spending. In these studies, spending is analyzed in aggregate and in terms of major public expenditure categories such as general, school, public safety and infrastructure-related services. It has yet to be established whether the local demand and incentive factors have uniform patterns of influence across spending categories. Moreover, Case, Rosen and Hines (1993) note that the sign and magnitude of the impact of governmental

interdependence may differ for each spending category. The variety of services under the local government's responsibility implies that the work ahead is substantial in volume if we are to meaningfully interpret how service-specific spending is determined.

In the context of decentralized developing countries where agriculture continues to be a relevant sector, a study that focuses on local government spending for agricultural services delivery has yet to enter the discourse. The challenge of such focus rests in being able to access more detailed information about fiscal expenditures at the local government level. In the Philippines, the structure of available data reported in central government agencies seem to explain why scholarship on local government fiscal behavior is usually limited to the analysis of broad expenditure categories like general, social and economic services at the local government levels, and service sector spending categories at aggregated levels (Capuno, et al., 2012; Manasan, 2009; World Bank & ADB, 2005; Loehr & Manasan, 1999; Manasan, 1997). As the recent transparency reforms are gradually establishing consistent posting of local government financial reports to government repositories and websites, researchers are gaining greater access to more detailed expenditure allocation information about the LGUs in the country. Inquiries focused on previously overlooked spending categories like agriculture support can now be pursued to shed light on fiscal behavior relevant to local rural development targets. This study initiates such effort with the objective of contributing to empirical gaps in local public spending literature and providing the unique case of Philippine municipal governments.

2.3 Hypotheses

Be it at the national or local level, the public budget is a representation of a government's policies for a fiscal year. As Anderson (2006) puts it, "The budget is not simply a financial statement; it is also a statement of policy" (p167). Monetary spending is necessary for the implementation of any policy. Since resources of the local government are limited, the decision making process that yields the municipal government's public spending allocations is one in which choices are made over a large set of competing post-devolution local service needs. This study views agricultural spending as a result of such a process. The decision model it proposes is focused on the mayor as the central actor, whose appreciation of local demand, municipal resource capacity, political incentives and inter-municipal dependencies ultimately leads to the municipal government's expenditure toward agricultural support. The following discussion depicts a combined economic and political process.

Agricultural support may not be equally prioritized by local governments since some municipalities are more dependent on the agricultural sector than others. This variation in the level of support for the agricultural sector is argued as the municipal government's response to the perceived local service demand, as approximated in terms if the relative size of the rural clientele. Although the preceding essay was not able to find support for the positive influence of rural clientele share on agricultural service delivery performance, this study proceeds to test whether the proportion of rural clientele positively affects the municipal government's policy for local agricultural support in terms of its spending allocation.

2.3.1 Municipalities with high proportions of rural constituents will spend more on agricultural support.

Current income is typically derived from a combination of forecasts of past incomes and anticipated additional monies from changes in IRA, local tax policies and other income-generating programs. It was observed in the preceding essay that on average, over 80 percent of the municipal incomes are actually comprised by IRA from the central government. This particular fiscal transfer practice in the Philippines somehow comes between competing views about the revenue-expenditure relationship tackled in the literature. Holtz-Eakin, Newey, and Rosen (1989) argue that local public expenditure is either simultaneously or inter-temporally influenced by locally-generated income or revenues. On the other hand, Dahlberg and Johansson (1998) challenge this argument and present empirical findings that claim the opposite direction of the relationship. In both studies, the influence of grants, which are the close equivalent of IRA from the central government, are evaluated separately. In this study, the overwhelming share of IRA in the municipal government's total income diminishes the need to separately analyze locally generated revenues from it. Instead, focusing on the gross income is considered as the realistic approach to explaining expenditure allocation in the setting of Philippine municipalities. The municipal government's income is simply assumed as a direct constraint to its expenditures while expenditures cannot be seen to directly affect future incomes, at least for now when a formula-based IRA accounts for much of the gross municipal income. Lower income levels force local officials to compress agriculture spending, along with (and probably in favor of some) other development priorities. Conversely, improvements in municipal incomes could ease pressures on local officials to put agriculture support to the back burner. This study tests

this positive influence of local government income on the municipal spending allocation for agriculture.

2.3.2 Higher income municipalities will spend more on agricultural support

In the Philippines, political disciplines are relatively in infancy and are continually being molded by dynamic changes in government behavior interacting with new flows of information brought about by decentralization reforms (Azfar, Gurgur & Meagher, 2004). The devolution shrunk the distance between providers and users of public goods. Constituents can more closely observe and attribute the performance of local officials who have become directly responsible for the delivery of devolved services in their jurisdictions. Such advantage in the access to information about local governance efforts further enhances the accountability of local officials to the citizenry who exercise their voice in the elections (Kaufmann, Mehrez & Gurgur, 2002). For the most part, it is the mayor, as local executive and deemed main policy actor in the municipality, who bears much of this accountability. Being cognizant of the power of the vote, incumbent party mayors exhibit opportunistic behavior by using expenditure decisions to signal a policy stance or governance effort to the citizens. Such behavior is captured in the political business model (Nordhaus, 1975) which first explained this behavior as response to "voter myopia" but later rationalized as a means of signaling competence to voters (Rogoff & Siebert, 1988). This model is later applied to research about local government spending in which expenditures were observed to increase during pre-election period, particularly for services most visible to voters (Veiga & Veiga, 2004; Foucault, Madies,

& Paty, 2008). The analyses test this behavior, along with the effect of the voting rates in the municipality.

2.3.3 Agricultural support spending will be higher in pre-election year

2.3.4 Agricultural support spending when the voting rate in the municipality is higher.

The influence of neighboring municipalities on fiscal expenditure allocations for agricultural support is also investigated in this study. While a host of explanations could justify relationship, such as learning, competition and cooperation, the inquiry primarily seeks to address the applicability of the fiscal interdependence thesis (Case, Rosen &Hines, 1993) to Philippine municipalities. This neighbor-effect is premised on the assumption that spillovers exist across geographic borders. When benefits and costs of another municipality's activities affect the welfare of citizens in the bordering jurisdiction, government officials in that neighboring community make efficiency-optimizing adjustments that would ensure certain services are neither underprovided nor over provided to citizens. With regard to agricultural support, spill-overs between border-sharing municipalities can be realized from complementary farm-to-market road and irrigation networks, joint development cluster activities, or even from farmer-to-farmer knowledge spill-overs from research and extension. This study tests whether the amount of municipal expenditures for agricultural services will fluctuate with the same allocations in neighboring municipalities.

2.3.4 Higher agricultural support spending of neighboring municipalities will lead to lower municipal expenditure allocated to agricultural services.

2.4 Data and Methodology

The hypotheses were tested using a balanced panel dataset profiling all the municipal governments in the island-province of Bohol from 2010 to 2012. The province was selected for this study for simplicity and convenience in analysis of neighbor effects in agricultural services spending because being geographically detached from other provinces limits similar spill-overs from municipalities in other provinces. Such could be a concern in testing the hypothesis on fiscal spending interdependence within the province. While it has a growing tourism industry, the province has primarily been agricultural, making the sector a priority in its development agenda. As in most parts of the country, rice is a major agricultural product in Bohol.

Bohol is located in the central part of the Philippine archipelago with a land area of about1590 square miles, which is just a little larger than Rhode Island. Distributed into the province's three congressional districts are 48 cities and municipalities, with all but three localities situated in the main island. Figure 2.1 is a representation of the province's political boundaries. The city of Tagbilaran, seat of the provincial government and a local offices of central government agencies, has been classified as a completely urban area and hence excluded from the study. A three-year fiscal data was obtained from the database of the Bureau of Local Government Finance (BLGF) for all 47 of the remaining municipalities. This information was augmented with demographic information from the National Statistics Coordination Board (NSCB) website. The panel data set corresponds to a full election cycle that begins with 2010 as election year.

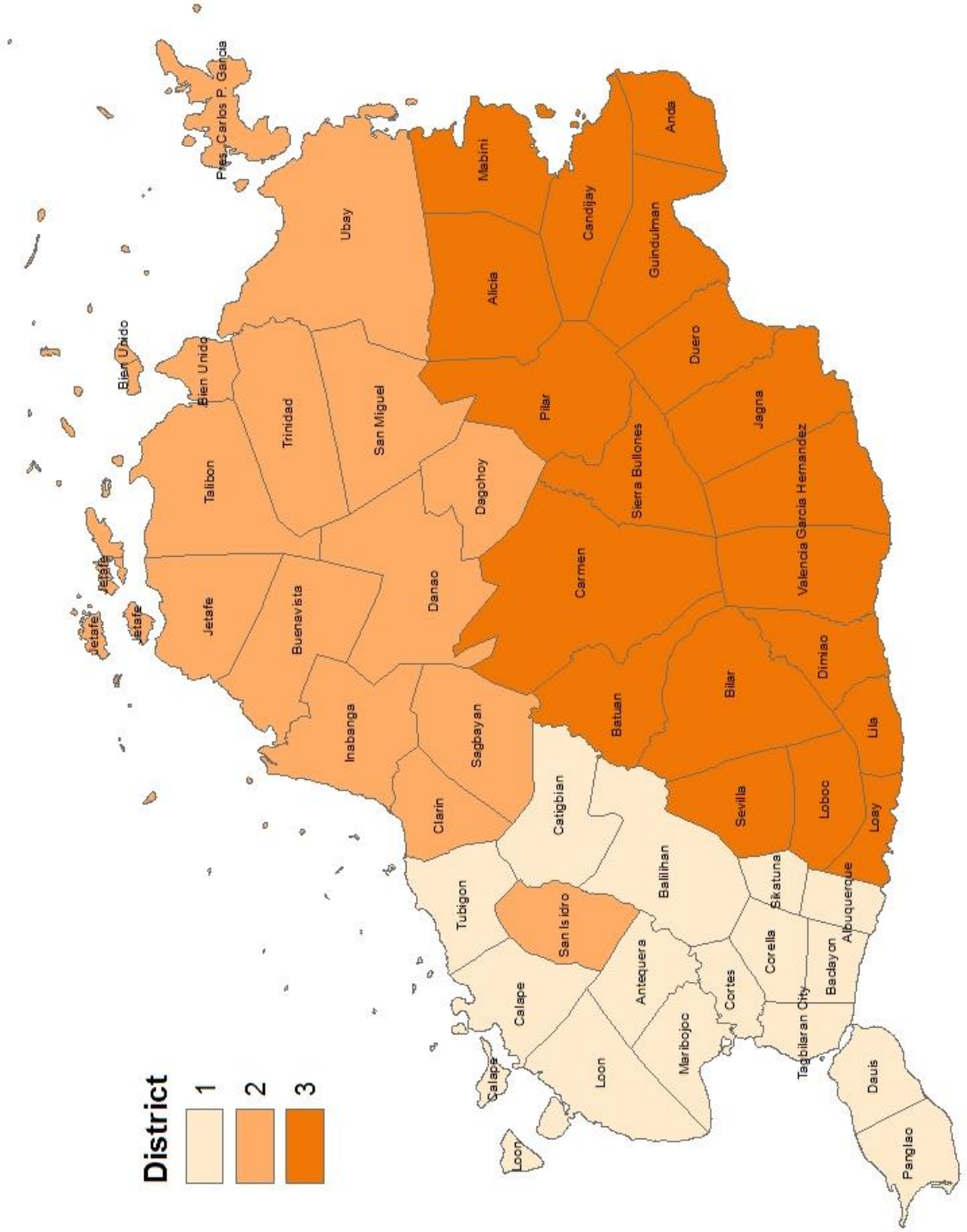

FIGURE 2.1: Political map of Bohol municipalities, by congressional district.

2.4.1 The Dependent Variable

Agricultural support expenditure is defined here as the amount in pesos of annual disbursed monies toward the purchase of goods and services for the conduct of normal operations of the municipal government solely for the conduct of agricultural service delivery. Such appropriations are mostly budgeted expenditures for the conduct of the municipal agricultural office's (MAO) daily business. It covers payment for personnel services, maintenance and other operating expenses (MOOE), financial expenses, and capital outlay expenses of the MAO. Since larger constituencies require greater resources for provision of public goods than others, municipal spending is considered here on per capita basis to standardize comparison across municipalities of different population size. The corresponding variable in the primary model for agricultural services spending is derived by dividing total agricultural expenditures by the total rural population.

2.4.2 Independent Variables

2.4.2.1 Share of Rural Constituency

As in the preceding essay, rural population share is considered as an approximation of local demand for agricultural service delivery. Rural population is defined as the number of people living outside urban areas--- people who are most likely dependent on the agricultural sector as main source of livelihood. Population figures sourced from the NSCB database are used to compute the share of the rural constituency, which is equivalent to the ratio of rural population to the total in each municipality. Given the modest fluctuations on population movements in the period covered, this variable is time-invariant.

2.4.2.2 Municipal Income

Financial data are sourced from the consolidated statements of income and expenditure (SIE) for municipalities archived at the BLGF website. The municipal government's income indicates the amount of funds available to the municipal government for allocation toward delivery of various services. It is inclusive of local incomes and IRA from the central government. As shown later, the heavy dependence of municipalities on IRA makes a separate look into impact of financial transfers redundant. Focusing on total municipal income as the measure of financial capacity to allocate spending toward agricultural services, this study divided it by the population and used the results as values for the income variable in the agricultural support spending model.

2.4.2.3 Political Factors

The cycle for local government elections in the Philippines is three years. In the period covered in this study, 2012 is pre-election year to the following cycle. Although earlier studies have argued positive influence of a pre-election year on public spending, gross public spending can also be expected to incrementally rise over time due to periodic movements in factor prices and service demands that grow with the population over time. Use of the per rural capita measure of agricultural support spending as dependent variable could address the influence of population growth. At the same time, specifying the robust standard errors to allow for intra-group correlation can control for estimation effects of periodic incremental expenditure increases for each municipality. Considering these adjustments, the effect of an election year is then tested through the inclusion of year dummies in which the pre-election year is designated as base year. With regard to testing the influence of voting rate on agricultural service spending, the ratio of the number of

actual voters over that of the total registered voters in the municipality is computed and added as explanatory variable. Values for this variable were taken from the 2007 and 2010 election statistics.

2.4.2.4 Neighbor's Spending

Complementarity of agricultural support spending is premised on neighboring municipalities sharing economic, demographic and ecosystem characteristics such that their rural development goals are comparable. Any spill-over effects of neighboring municipalities' agricultural support activities should therefore matter to the municipal government that is making a spending allocation decision toward its own service delivery. The neighbor-effect on a municipality's agricultural spending is derived as the mean of per rural capita expenditures toward agricultural support by all municipalities with which it shares a border. This study's use of "common borders" as the criteria for defining neighbor-effects is the most simple and logical way of capturing spill-over effects between municipalities although there are admittedly other ways of defining "neighborliness" (Case, Rosen & Hines, 1993). In this measure, all neighbors are assumed to have equal influence on a municipality's agricultural spending.

Univariate global Moran's I statistics were generated for municipal spending. to examine spatial autocorrelation across the province, which might be accounting for the neighbor effects. Just like a Pearson correlation coefficient, Moran's I generally ranges between -1 and 1, with positive values indicating positive autocorrelation and vice versa (Kalkhan, 2011). The statistics and corresponding scatterplots were calculated through the use of the GeoDa software for geodata analysis (Anselin, 2003).

2.4.3. Model and Estimation Technique

This study tests the hypotheses by estimating an empirical model for municipal agricultural support spending ($AGEXP_{it}$) as influenced by the high rural constituency share ($RURAL_{it}$), financial capacity ($INCOM_{it}$), political incentives (YEAR and $VOTERT_{it}$), and the average spending of neighboring municipalities ($NEIGH_{it}$). It also considers what is argued in the literature (Holtz-Eakin, 1986) as time-invariant and unobserved characteristics of the municipality that might affect spending allocations for local services. Some municipalities have a politically engaged constituency that is able to articulate demands for agricultural services in ways other than voting in the elections while some have a more passive citizenry. Furthermore, some communities tend to be more oriented to rural development agenda than others, even with comparable shares of rural constituency. In such scenarios, the time-invariant and unmeasured individual or municipal effect can influence agricultural support spending. Its effect on the standard error estimates is controlled for in the estimation of a fixed-effects (Equation 2.1) and a random-effects (Equation 2.2) model.

$$AGEXP_{it} = \beta_0 + \beta_1 RURAL_{it} + \beta_2 INCOM_{it} + \beta_3 2010 + \beta_4 2011 + \beta_5 VOTE_{it} + \beta_6 NEIGH_{it} + \alpha_i + u_{it} \quad (2.1)$$

where
α_i is the unknown intercept for each municipality
u_{it} is the error term

$$AGEXPit = \beta_0 + \beta_1 RURALit + \beta_2 INCOMit + \beta_3 2010 + \beta_4 2011 + \beta_5 VOTEit + \beta_6 NEIGHit + u_{it} + \varepsilon_{it} \quad (2.2)$$

where
u_{it} is the between-entity error
ε_{it} is the within-entity error

There are contradicting views about the incremental nature of governmental budgets. In the sixties, a group of scholars have observed how government budget is predicted by the previous year's budget (Wildavsky, 1964; Davis, Dempster & Wildavsky, 1966; Sharkansky, 1968). Other scholars have however challenged the strength of incrementalism's effect in budgeting (McCubbins & Schwartz, 1984; Berry & Berry, 1990). For Philippine municipalities, the standard report form for the municipal government's programmed appropriation and obligation in the current year includes reference to past year figures (See Appendix E for reference). Such practice does not necessarily imply that current expenditure allocations of Boholano municipal governments are predicted by previous expenditures; rather, it shows that the effect of previous budgets on current ones cannot be completely ignored in the proposed spending model. Although serial correlation may be more of a concern for panels with long time series, cluster-robust standard errors were specified in the estimations in order to produce "correct" standard errors despite the presence of correlations among the reported yearly agricultural spending for each municipality (Angrist & Pischke, 2009). By assigning the municipal ID as the clustering variable, the estimations basically relax the assumption of independent observations within each municipality but maintain the same assumption across municipalities. This specification also produces standard estimates that are robust to disturbances being heteroskedastic.

2.5 Results

Bohol has one component city and 47 municipalities. The analyses were applied to all Bohol LGUs, with exception of the city of Tagbilaran which was reported to be the only completely urban locality in the province. Observations for each municipality covered the each of the three panel periods, making for a balanced panel data set.

2.5 1 Trend and Distribution of Agricultural Service Spending

The summary of agricultural spending variables in Table 2.1 shows that the average annual spending for agricultural services in the period covered is PhP 1.72 million. This amount comprises about 3.42 percent of the total municipal spending, way smaller compared to the 17 percent average share of economic services spending across municipalities in the province. These budget allocations for agricultural spending average PhP96 per rural constituent.

TABLE 2.1: Agricultural services spending in Bohol, 2010-2012 .

Variable	2010	2011	2012	2010-2012
Gross agricultural support spending (PhPmilion)				
Mean	1.58	1.78	1.79	1.72
Standard deviation	1.11	1.23	1.39	1.24
Minimum	0.48	0.31	0.40	0.31
Maximum	6.84	7.52	8.74	8.74
Agricultural support spending share (%)				
Mean	3.36	3.54	3.35	3.42
Standard deviation	1.49	1.54	1.34	1.45
Minimum	0.73	0.70	1.00	0.70
Maximum	8.07	8.55	9.01	9.01
Agricultural support spending per capita (PhP)				
Mean	91.43	100.21	96.83	96.16
Standard deviation	66.95	70.66	64.24	66.95
Minimum	14.07	24.20	21.37	14.07
Maximum	449.53	465.33	420.18	465.33

The measure of gross agricultural expenditure by rural clientele unit enables comparison across municipalities with varied sizes of target beneficiary population. Figure 2.2 illustrates the average trend for per rural capita agricultural spending across the province. It can be noted from the map that majority of the municipalities belong to the three lowest quintiles, in which spending values fall below the province-wide average.

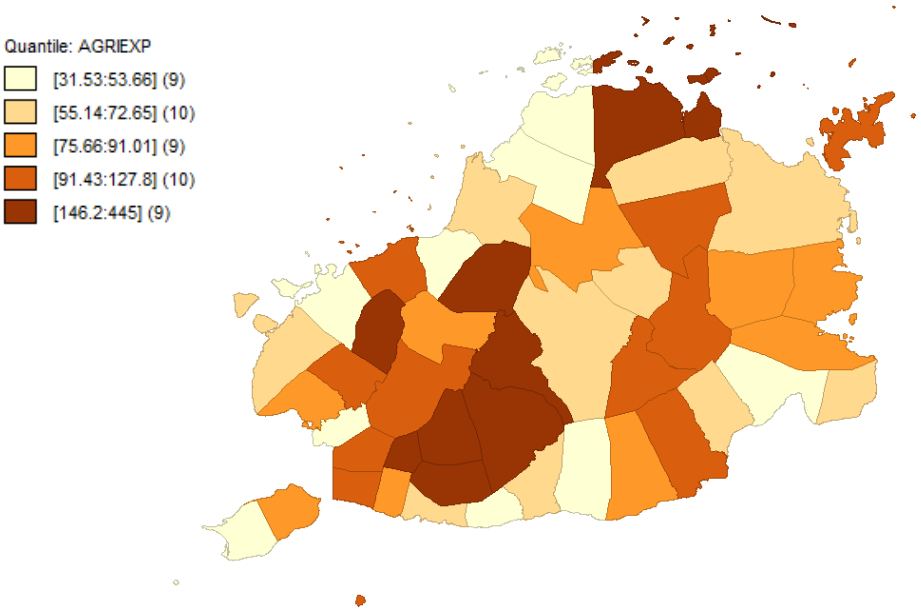

FIGURE 2.2: Thematic map of average agricultural services spending in municipalities of Bohol, 2010-2012.

Figure 2.3 illustrates the trend for average per rural capita agricultural spending from 2010 to 2012, relative to per capita income, gross expenditures, and economic services spending. The figure highlights the comparatively very low amount of agricultural spending. Considering that agriculture is a major economic sector in these municipalities, it is remarkable how unit spending for agricultural support is merely one-

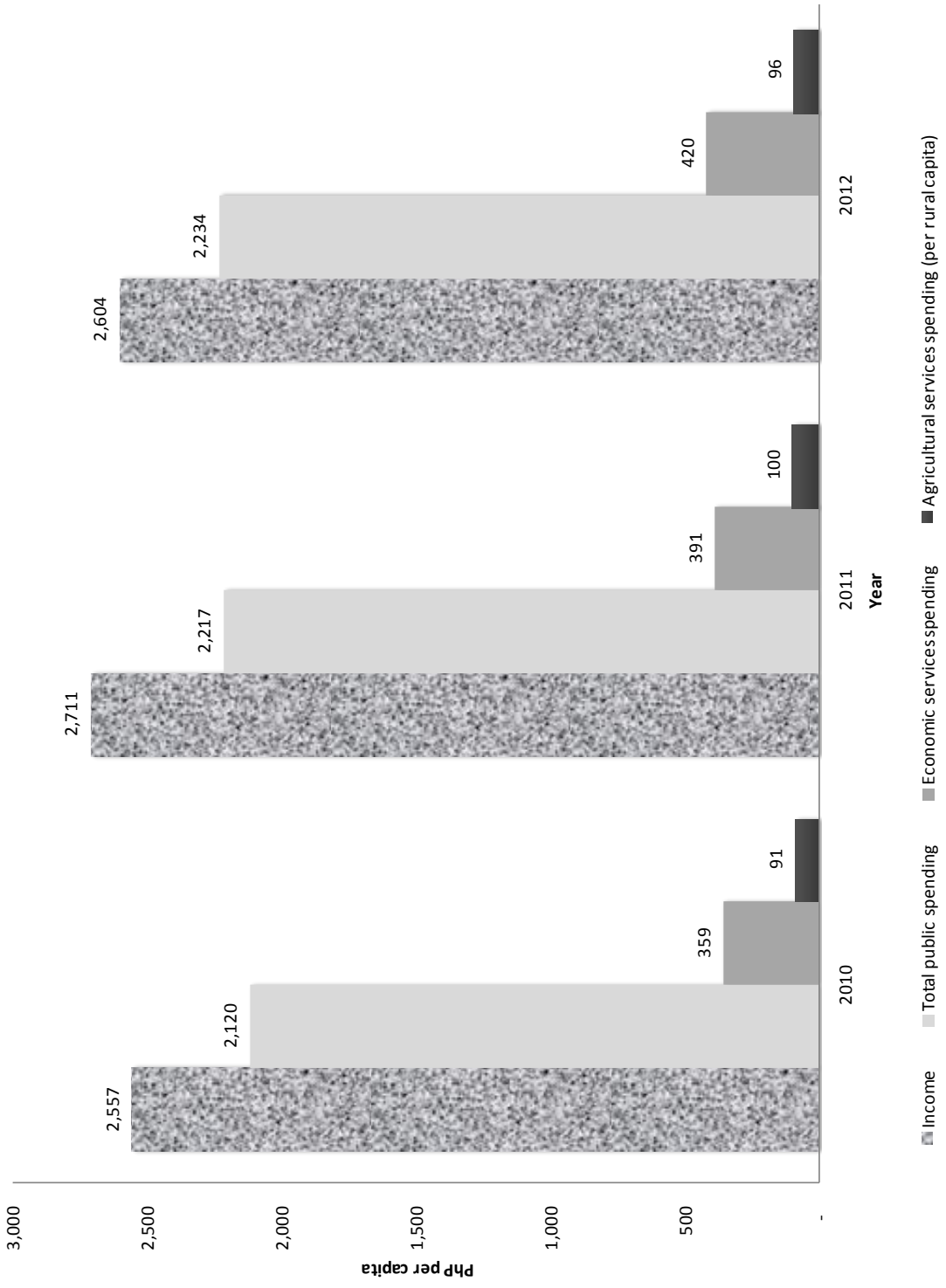

FIGURE 2.3: Per capita municipal income and expenditures (PhP), 2010-2012.

fourth of the average economic services spending per individual. The amount is dwarfed when other spending priorities like general, education and other public services items are jointly considered in the total per capita public expenditure. The estimations conducted later in this study look into local factors and neighbor-effects that might explain this level of agricultural expenditure allocation.

The breakdown of municipal agricultural spending in Table 2.2 indicates that much of the resources expended by the municipal government toward the delivery of support to the agricultural sector mostly involve the upkeep of daily operations of the municipal agriculture office (MAO). About 70 percent of the agricultural spending is made up of expenses for payment of employee salaries and wages, benefits and other compensation. The manpower at the MAO is made up of administrative and extension workers, some of whom were assigned from the central government offices during the devolution. In addition to organizing consultation meetings and other projects for farmer-constituents, the extension staffs perform coordination duties with counterparts in the provincial and other municipal governments. Where implemented, they are also assigned to monitor nurseries and other on-site research projects of the MAO. Maintenance and other operating expenses (MOOE) for the purchase of supplies, travel and communication expenses, repair and maintenance, and other goods and services comprise about 27 percent. From interviews with MAO staff in Bohol, the MOOE mostly covered the upkeep of the office and its coordination activities. With regard to providing farmers access to farming inputs, the MAO has largely been responsible for the coordination of subsidies from higher tiers of the government as well as in facilitating purchase through consignment arrangements with private suppliers. Next to capital outlay

expenditures, expenses for specific project activities such as demo farms, quality control and irrigation make up the rest. Appendix E is a sample budget appropriation form reporting expenditure allocations for each fiscal year. It includes a more detailed list of line items under each major spending category indicated in Table 2.2.

TABLE 2.2: Breakdown of average municipal agricultural expenditures.

Line Item	2010		2011		2012	
	(Php million)	(%)	(Php million)	(%)	(Php million)	(%)
Personnel Services	1.001	70	1.131	70	1.145	71
MOOE	0.521	26	0.622	28	0.562	27
Debt Servicing	-	-	-	-	-	-
Capital Outlay	0.055	3	0.027	2	0.052	1
Project Activities	0.089	1	0.292	1	0.339	1
Extension & research	-	-	-	-	-	-
Demonstration/farm nurseries	0.002	0	0.008	0	0.009	0
Operation of farm equipment pool	-	-	-	-	-	-
Quality control of agri products	0.001	0	0.003	0	-	-
Irrigation System	0.002	0	0.001	0	0.006	0
Total Expenditures on Agricultural Services	1.577	100	1.780	100	1.759	100

Source: BLGF

2.5.2 Measures of the Explanatory Variables

About three-fourths of the municipalities in Bohol belong to the two lowest income classes (Table 2.3). The average municipal income is about PhP59million, a little under half of the mean for the municipalities in the country (Table 2.4). About 62 percent of the municipalities fall below this average (Figure 2.4). Among the richest municipalities are Carmen, Talibon and Ubay.

TABLE 2.3: Distribution of municipalities by income class.

Classification	Frequency	
	No.	Percent
First-class municipality	3	6
Second-class municipality	2	4
Third-class municipality	6	13
Fourth-class municipality	24	50
Fifth--class municipality	12	25
Third-class component city	1	2
Total	48	100

TABLE 2.4: Municipal incomes.

Variable	2010	2011	2012
Income (PhPmillion)			
Mean	55.88	60.28	59.96
Standard deviation	20.49	21.92	24.98
Minimum	27.60	25.26	28.11
Maximum	109.08	123.82	140.62

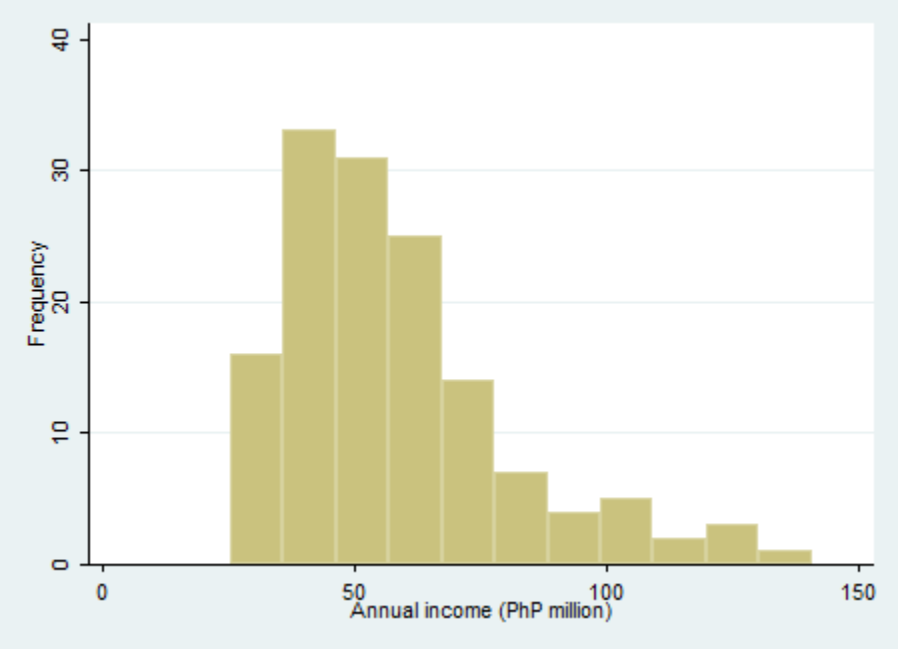

FIGURE 2.4: Frequency distribution of incomes (PhPmillion), 2010-2012.

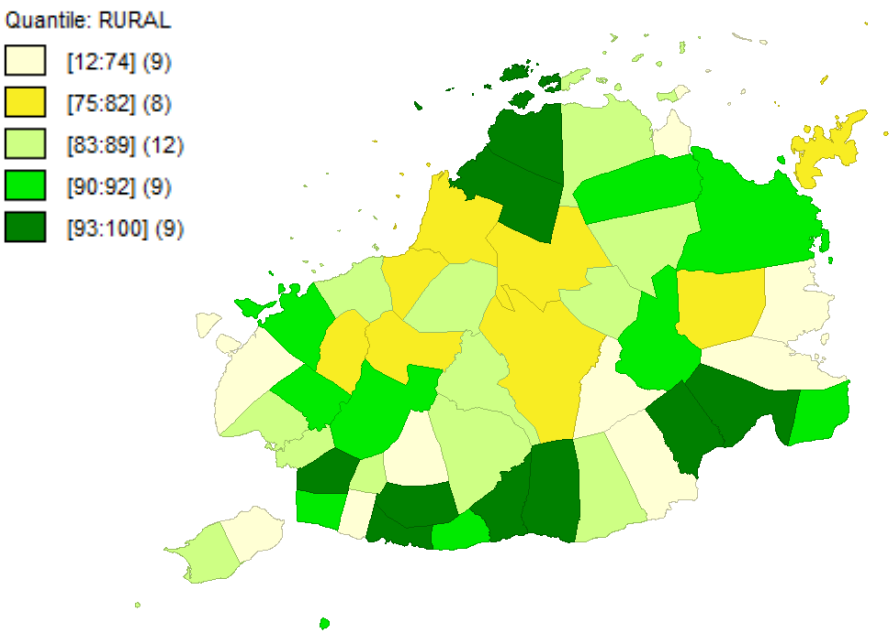

FIGURE 2.5: Rural and urban populations of Bohol municipalities, 2010-2012.

Rural constituents make up a substantial share of the population in most Boholano municipalities. As can be observed in Figure 2.5, all except Bien Unido and Dauis have majority rural populations. The average share of rural population is about 83 percent, with approximately 64 percent of the municipalities exhibiting higher proportions. About one-third of the municipalities have at least 90 percent rural population. Figure 2.6 reflects this distribution. Furthermore, given the short length of the panel, rural population shares have not changed over time.

Voting rates are generally high across the country. In Bohol, the average of proportion of voters who actually casted votes in the previous local elections is 84 percent and ranges from 67 to 89 percent. The distribution of this variable is presented in Table 2.5.

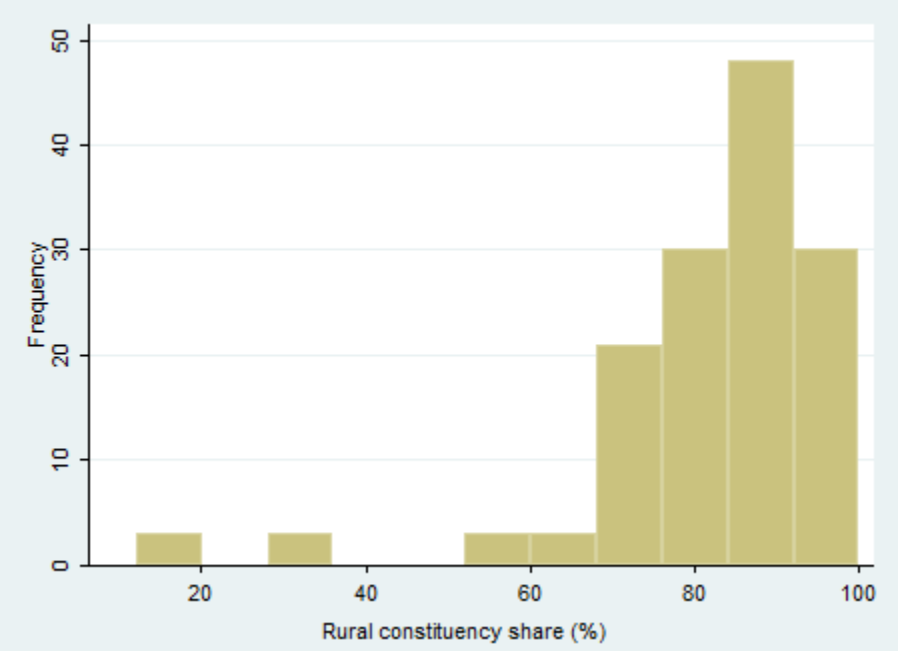

FIGURE 2.6: Frequency distribution of % rural constituency, 2010-2012.

TABLE 2.5: Voting rates (%) by election year.

Variable	2007	2010	Mean
Mean	82.84	84.41	83.63
Standard deviation	3.66	3.13	3.48
Minimum	67.34	70.72	67.34
Maximum	87.57	88.55	88.55
N	47	47	94

The computed averages of agricultural expenditures for municipalities sharing a border with each subject are presented in Table 2.6. These figures are comparable to the agricultural expenditures reported in Table 2.1. Since this variable was used in the model estimations, spatial autocorrelation was examined for agricultural spending (per rural capita) across the province. Moran's I statistic was computed for clusters of four, six, eight and ten nearest neighbors in order to detect interrelatedness in agricultural spending

beyond the extent of "neighborliness" strictly defined in the proposed model as shared borders. Results of the spatial analyses are summarized in Table 2.7. The Moran's I values are generally close to zero, indicating weak spatial autocorrelation in agricultural spending among the municipalities. Figure 2.7 illustrates the patterns of spatial autocorrelation for three-year agricultural services spending averages. It can be noted that regardless of the assumed number of nearest municipal neighbors, the standard deviations of the variable are .generally clustered around the central axis. The slopes of the regression lines are equivalent to the Moran's I values in Table 2.7 and as earlier noted, rather small. Moreover, the calculated reference distribution for spatially random layouts with the same values as observed (Figure 2.8) did not show the Moran I statistic to be significant. Since spatial analyses did not yield statistically significant spatial autocorrelation, this study proceeds to use of its proposed neighbor-effect measure.

TABLE 2.6: Neighbors' spending for agricultural services.

Variable	2010	2011	2012
Gross agricultural support spending (PhPmilion)			
Mean	1.67	1.95	2.01
Standard deviation	0.68	0.83	1.03
Minimum	0.58	0.91	0.86
Maximum	4.13	4.57	5.32
Agricultural support spending per rural capita (PhP)			
Mean	89.61	100.38	98.20
Standard deviation	26.75	25.51	25.61
Minimum	32.70	42.59	41.42
Maximum	153.63	167.63	171.82

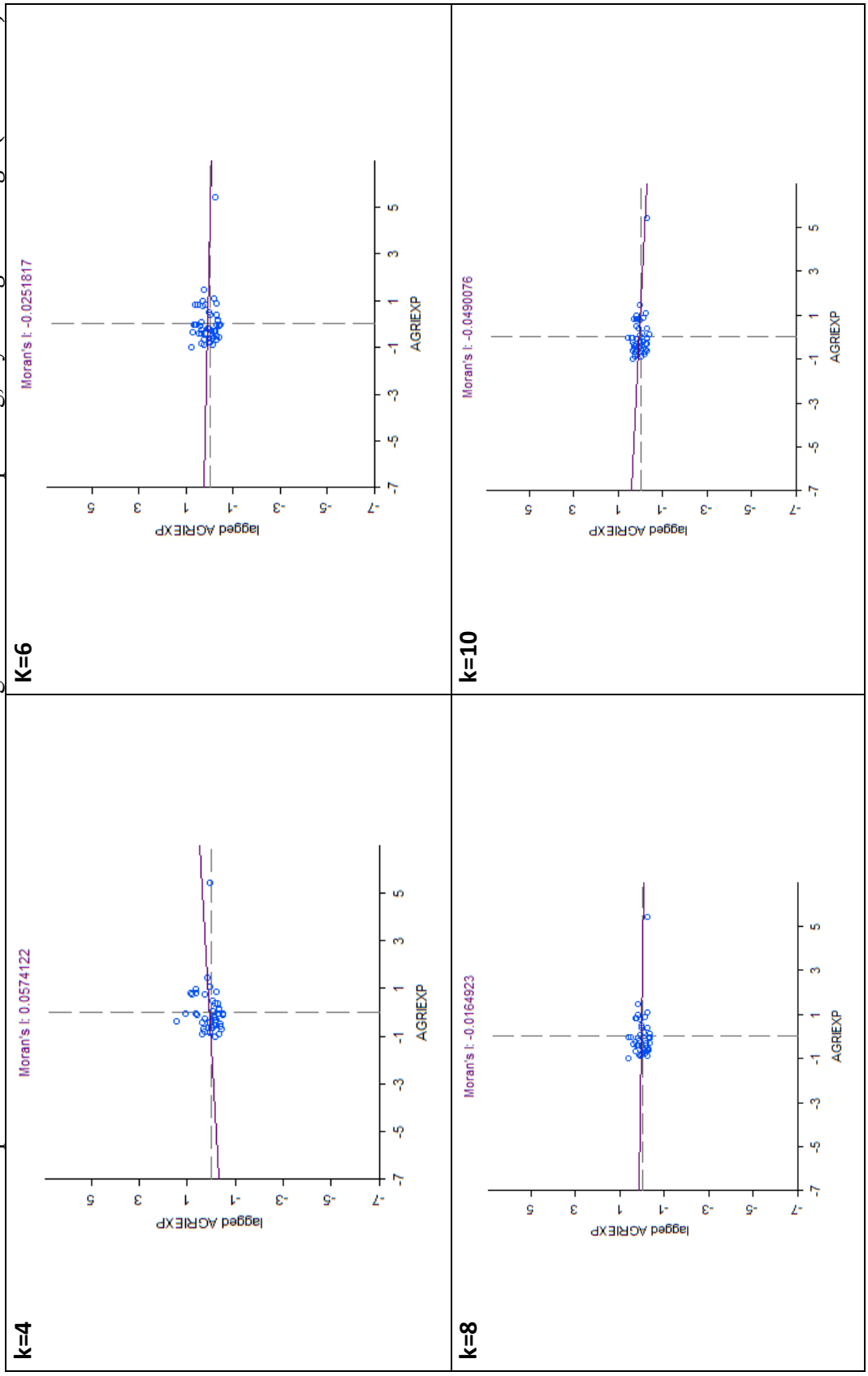

FIGURE 2.7: Scatterplots of univariate Moran's I statistics for agricultural services spending, by k-neighbor weight (2010-2012).

TABLE 2.7: Univariate Moran's I for agricultural services spending in Bohol, 2010-2012.

K-Nearest Neighbors	2010	2011	2012	2010-2012
k=4	0.0941	0.0243	0.0223	0.0574
k=6	0.0024	-0.0455	-0.0396	-0.0252
k=8	0.0150	-0.0369	-0.0392	-0.0165
k=10	-0.0244	-0.0657	-0.0596	-0.0490

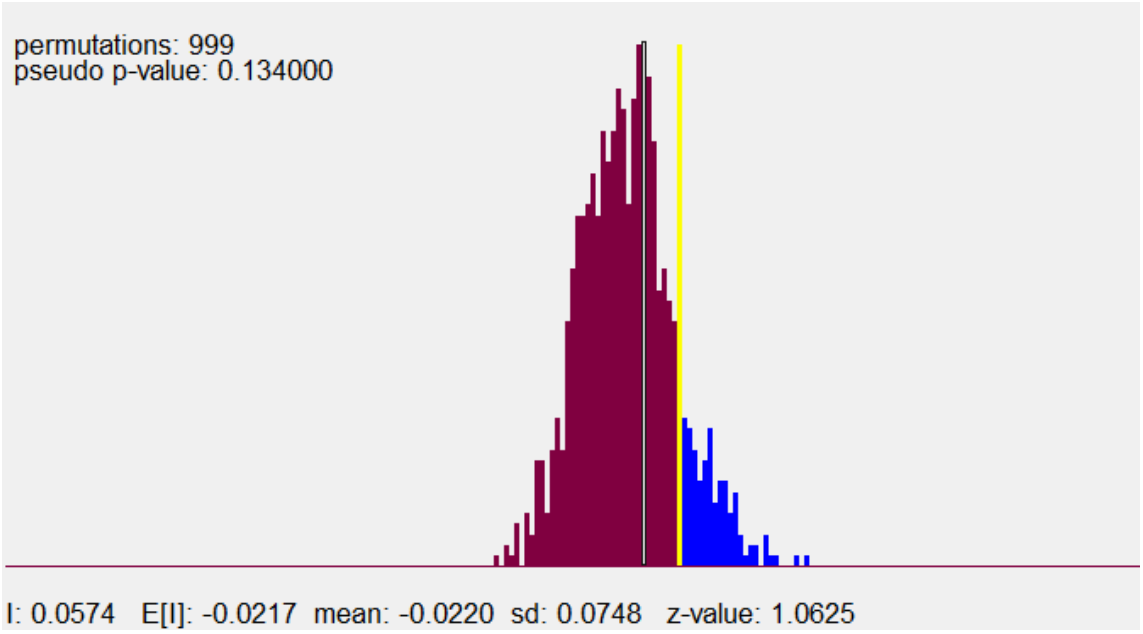

FIGURE 2.8: Reference distribution of Moran's I for average agricultural services spending (k=4 nearest neighbors).

2.5.3 Estimation Results

Results of the fixed-effects and random-effects regressions are summarized in Table 2.8. Both estimation models used municipal ID as group variable and a total of 141 observations for 47 groups representing each of the municipalities in the province. Fixed effects regression was first done to control for time-invariant variables that might be correlated with the explanatory variables. Aside from rural constituency share and other time-invariant municipal characteristics, unobserved or unmeasured characteristics that are uniquely attributed to each municipality such as leadership capacity and local agricultural sector climate are also controlled for by fixed-effects regression. These factors can shape whether agricultural spending is seen as fiscal management strategy or a governance tool for local economic development. In the case of rural constituency share, the values are practically constant over the period of three years and are hence automatically omitted as a predictor variable from this estimation. Its effect, along with other time-invariant variables, is incorporated into the intercept.

The fitted fixed-effects model was significant at one percent alpha. The estimates have provided support only for significant influence of neighbor-effects on the municipality's agricultural services spending. In particular, every peso increase in the average per rural capita agricultural support expenditures of a municipality's immediate geographic neighbors leads to a 67-cent average decrease in the municipality's own spending, at one percent level of significance. On the other hand, random-effects regression was applied to account for omitted variables that are random and uncorrelated with the explanatory variables. Since the Hausman test in Table 2.9 revealed that the coefficients estimated by the efficient random effects estimator are the same as the ones

estimated by the consistent fixed effects estimator, this study proceeded with the use of the random-effects model. Random-effects regression has allowed the inclusion of the time-invariant variable—rural constituency share— in the model as a predictor variable.

TABLE 2.8: Panel estimates for agricultural services spending per capita (n=141).

	Fixed Effects		Random Effects (GLS)	
Independent Variables	**Coefficient**	**Robust se**	**Coefficient**	**Robust se**
Rural population share (%)	(omitted)		-2.54	1.33
Income per capita (PhP)	0.01	0.01	0.02 ***	0.01
Percent actual voters	0.33	1.74	0.47	1.41
Year Dummy				
2010	-10.13	5.37	-6.09	4.59
2011	3.81	4.47	1.54	4.50
Neighbors' agricultural spending	-0.67 ***	0.18	-0.30 **	0.14
Constant	110.12	141.73	237.40	150.65
F(5,46)	3.84 ***			
Wald chi2(6)			29.51 ***	
sigma_u	65.95		45.55	
sigma_e	21.83		21.83	
rho	0.90		0.81	

Note: ***p < 0.01
** p < 0.05

TABLE 2.9: Hausman test results.

	Coefficients			
Independent Variables	**Fixed (b)**	**Random (B)**	**Diff (b-B)**	**s.e. sqrt(diag(V_b-V_B))**
Income per capita (PhP)	0.01	0.02	-0.01	0.01
Percent actual voters	0.33	0.77	-0.44	0.75
Year Dummy				
2010	-10.13	-7.68	-2.45	1.79
2011	3.81	2.77	1.04	0.70
Neighbors' agricultural spending	-0.67	-0.50	-0.17	0.10
chi2(5)	3.10			
Prob>chi2	0.6852			

The random-effects estimates have an R^2 of 0.1076 for predicting the within model and 0.4344 for the between model. If these estimates were used to fit the overall data, the R^2 is 0.4082. Joint significance for all slope coefficients was confirmed by the Wald statistic (29.51) which was significant at one percent alpha. The resulting GLS estimates for the random-effects model provide support for the hypothesized role of municipal income and neighbor-effects on a municipal government's spending toward agricultural services. The model shows that at one percent level of significance, every peso increase in the per capita municipal income across the years brings about an average increase of two centavos in per rural capita spending for agricultural services. The magnitude of the effect is modest, reflecting the relatively weak place of agricultural service delivery in resource allocation priorities of the municipal government. Going back to Table 2.1, agricultural services spending makes up about three percent of the municipal spending while the entire economic spending category (in which agricultural spending is included) takes up 17 percent of the total expenditures.

With regard to neighbor-effects, every peso increase in neighboring municipalities' mean agricultural services spending (per rural capita) leads to an average decrease in the municipality's own spending by 30 centavos, at 5 percent level of significance. This result suggests significant extent of spill-over effects from across municipal borders such that when the level of agricultural support activities and spending are higher for the neighbors, the level of the municipal government's own provision is lower. The Breusch and Pagan Lagrangian multiplier (LM) test for random effects confirmed significant differences across municipalities. About 81 percent of the variance is due to differences across panels.

The influence of rural constituency share on municipal agricultural service spending was not found to be statistically significant at 5 percent alpha; it was however negative and significant at 10 percent. These analyses of the data from Bohol municipalities do not provide sufficient support to the assertion that municipal governments are responsive to local service needs—at least not when service needs are considered in terms of the proportion of the rural clientele in the local population. If we extend interpretation of the results to consider the marginal statistical significance of this variable, the influence is even contrary to expectations.

Finally, none of the political factors were found to have significant effect on agricultural support spending. Higher voting rates did not significantly improve agricultural services spending. Moreover, the pre-election year (2012) did not exhibit significantly higher spending per rural capita. Going back to Table 2.1, it can be noted that the average per rural capita agricultural spending for 2012 was even slightly lower than for the previous year.

2.6 Discussion and Conclusion

It was obvious early in the analyses that on average, agricultural support has not been a spending priority for municipalities in the study. Following Anderson's (2008) reasoning, such is the apparent local policy with regard to agricultural service delivery. It would not be surprising to find this observation extend to the rest of the municipalities in the country if the economic services spending patterns were the basis. Parallel to the nationwide trend cited in the preceding essay, economic services spending in Bohol comprise about 17 percent of the total municipal expenditures. The meager three percent share of agricultural support spending in Boholano municipalities is a reflection of the

many competing responsibilities that these LGUs have to fund through the limited resources it has for disposal. Estimates of the random effects model for agricultural support spending however provide much helpful insights into such spending level.

One of the remarkable findings from the analyses is the lack of statistically significant influence of rural constituency share on the municipal government's spending for agricultural support (Hypothesis 2.3.1). Revisiting the argument that decentralization gives way to more locally responsive service delivery (Oates, 1993; Wallis & Oates, 1988), results suggest that this does not necessarily translate into the movement of agricultural support spending toward the same direction as the share of the rural constituency to whom this service matters. It invites reconsideration of the original intent for which the variable was selected--- to signal local demand for agricultural support.

As noted in the preceding essay, rural constituency share is an indirect approximation of local demand for agricultural support and does not provide as much detail about citizen preferences for public services as surveys do. However, citizen surveys also come with some hitches. For one, surveys can be time-consuming and costly as the scope of coverage broadens. Secondly, many surveys are criticized for design flaws that fail to control tendencies of citizen-respondents to overstate preferences for public service (Miller & Miller, 1991). Since the principle of measuring local service needs through aggregate demographic data has been done in other public scenarios (Simonsen, 1994; Ladd & Murray, 2001), rural constituency share is still arguably a conceptually acceptable technique for ascertaining local agricultural support needs. The challenge is in differentiating its impact from those of local government performance determinants that are closely associated with rural communities such as income.

Owing to the scope of this study being limited to just 47 municipalities over a short period and the skewness of the rural constituency share toward high values, variation in the values for this variable is very limited, which in turn affects the estimates of its influence on agricultural support spending. Such relationship can be revisited through a wider geographical scope and/or a longer panel. Furthermore, the lack of relationship may be due to budgeting and service co-provision arrangements that weaken any link between perceivable demand from constituency share and agricultural support spending. For one, the breakdown of spending detailed in Table 3 indicates that much of the financial resources are devoted to administrative upkeep and coordination functions of the MAO, which are not necessarily elastic to the relative size of the clientele population. The amount of funds left after paying for personnel services and MOOE is allocated to project activities, which, given very limited resources, only comprises one percent of the total agricultural support spending. Moreover, anecdotal accounts of MAO staff indicate that the expenses for other forms of agricultural support coursed through the municipal government are funded by either the provincial government or central government agencies. While these concerns may hamper analysis of demand-responsiveness, the municipal government's agricultural spending nevertheless reflects the extent of its commitment to the mandate of devolved agricultural service delivery and hence warrants inquiry into its other determinants.

The modest positive influence of income on agricultural services spending confirms the second hypothesis. Put simply, increasing the size of the proverbial pie increases public spending for agricultural support, even if it receives only a very small slice. This income effect may likewise be seen as effect of the volume of central

government transfers since IRA generally makes up much of the municipal incomes in the province.

The coefficients for voting rate and the year dummies were not found to significantly affect agricultural support spending. However, this result does not necessarily dismiss the importance of local citizens' political voice in local fiscal decisions altogether. Instead, the failure to accept the corresponding hypothesis (2.3.3) point to the summative nature of the citizen's vote as an assessment mechanism of the incumbent LGU leadership's performance. Considering that agricultural support is only one of the many devolved services in the charge of the municipal government, efforts of locally elected officials to signal performance are more meaningfully appreciable in aggregate spending than in sector specific allocations, even in places where the agriculture is considered as the most important economic sector.

The major message that can be drawn from the results is that municipal agricultural spending is as much a locally influenced decision as it is shaped by allocation choices outside its borders. Agricultural spending allocations of adjacent municipal governments significantly influence a municipal government's own fiscal choices. As argued in the literature, awareness of the activities of one's immediate municipal neighbors inform the LGU about the spill-over of benefits across jurisdictional boundaries for which it does not need to financially provide. Greater autonomy from decentralization reforms has therefore not limited municipal governments' policy decision making within their boundaries. As presented in this study, expenditure interdependence characterizes municipal agricultural support delivery in Boholano

municipalities, and perhaps in the rest of the Philippines. Such extension however calls for a broader scope of study

2.7 Implications for Policy and Practice

Spending indicates the extent of the municipal government's commitment to agricultural sector support. It can be noted from the case of the municipalities in Bohol that agricultural services delivery are at the lower level of local government's spending priorities. The agricultural services spending behavior modeled here offers valuable insights that can guide efforts to boost the delivery of these devolved services either through fiscal budgeting changes or alternative measures.

As the analyses revealed, municipal income plays a significant role in boosting fund allocations toward agricultural services. Considering that IRA funds most of the municipal governments' budget, the effect of income on agricultural support spending has a couple of implications for the allocation of the IRA transfers. First, the IRA allocation scheme could be reviewed for adjustments in gross receipts for the LGU. This review can also be done to explore ways of directly channeling or assigning these transfers toward agricultural support provision. The Local Government Code (LGC) currentlyt stipulates appropriation of no less than twenty percent (20%) of the IRA toward local development plans. However, the projects for which these funds can be expended do not strictly have to address the local needs in the agricultural sector. These funds usually go to priority infrastructure projects that the mayor and the municipal council deem as most relevant to the locality. In light of finding that rural clientele share and election-related incentives do not significantly move local budget policies toward favoring agricultural services spending, it seems that bringing agricultural support to the

budgeting agenda of local officials requires a less passive trigger. In this case, stakeholders have an imperative task of actively lobbying for the allocation of IRAs, local development appropriations, and other public resources toward support for the agricultural sector.

One way municipal governments get around financial constraints is by establishing partnership with other government units and the private sector in the provision of agricultural services in their localities. The full costs of such arrangements are not fully borne by the municipal government. In many cases, the municipal government only bears the costs of coordinating service provision. For example, some of the MAOs in Bohol enter into consignment arrangements with seed and fertilizer producers to provide local farmers access to these farming inputs. The expenses incurred from such activities are imputed to the MOOE as part of the regular operations of the MAO. In such cases, agricultural spending does not fully reflect the value of certain service activities that the LGU co-provided with other entities.

Neighbor-effects on agricultural support spending indicate spill-over of benefits across municipal boundaries. On one hand, awareness of the spill-over benefits of a neighbor's agricultural spending can be seen as an incentive for the municipality to free-ride and under-provide for the local agricultural sector. On the other hand, this points to an opportunity to promote efficient use of resources within a cluster of neighboring municipalities. Awareness of benefit spillovers can motivate inter-municipal partnerships for the provision of agricultural services. Creation of such ties will need institutional prodding from the provincial government, central government agencies and other government partners. One case of such partnership is the Bohol Integrated Area

Development Cluster V (BIAD V). BIAD V is composed of eight municipalities in the inland area of the Bohol that have coordinated efforts to promote the production of organic rice in the area. Existing arrangements like that of BIAD V can be reinforced with capacity building support.

2.8 Caveats and Future Work

The geographic and analytic scope of this inquiry limits the extent to which findings can be generalized. For one, this study's focus on Boholano municipalities enables it to define neighborliness in terms of shared borders because most of the island-province is part of a contiguous landmass. While this definition of a neighbor seems appropriate in considering service benefit spillovers between adjacent localities in the province such as sharing of knowledge from extension services between farmers living on either side of a municipal border or the access benefit of a constructed or reinforced farm-to-market road, it does not apply to geographically disjointed municipalities, and is too simplistic to accommodate benefit spillovers between municipalities from different provinces as is the case in the larger islands. For an archipelago such as the Philippines, the neighbor concept used here will not be applicable to other areas in the country. Moreover, this approach ignores service benefit spillovers beyond the adjoining borders. In such case, neighbor effects may become underestimated. The spatial autocorrelation analysis executed here introduces alternative ways that the concept of neighbor-effects can be analyzed for in agricultural services spending. The technique was not only useful in verifying for random patterns of spending across the province; it also demonstrated the utility of "nearest-neighbor" weighting, which could be applicable to an expansion of inquiry beyond Bohol. This will be subject of a future inquiry.

This study recognizes that inclusion of a few other variables would have contributed significant insights into municipal performance. Although political determinants were included in the analyses, the inclusion of mayoral incumbency and tenure history could also inform about the influence of other aspects of political motivation that drive variations in agricultural services spending across the municipalities. Additionally, consideration of lagged effects of income and neighbor spending could shed light into possible endogeneity issues.

Finally, the applicability of the spending behavior modeled in this study can be explored for expenditure patterns in alternative public services that have been devolved to local governments.

CHAPTER 3: THE INFLUENCE OF NETWORK EMBEDDEDNESS ON ATTITUDES TOWARD ORGANIC FARMING PROMOTION: A STUDY OF MAYORS IN BOHOL, PHILIPPINES

3.1 Introduction

Owing to decentralization reforms that came with the 1990 Local Government Code (LGC), local governments in the Philippines have been exercising greater direct authority over the delivery of devolved public services in their localities. The devolution counted on local government units (LGUs) to effectively assess local conditions and directly respond through a more autonomous system of governance. However, local determinants only partly explain policy choices of these subnational governments. As argued in the research on state policy innovation in the US, external influences also matter to policy adoption through the process of policy transfer. To date however, the extent to which policy transfer influences policies in the Philippine local governance system has yet to be explored.

One of the recent policies for consideration of LGUs is the local adoption and implementation of Republic Act 10068, otherwise known as the "Organic Agriculture Act of 2010" (OAA). As the OAA defines organic agriculture according to ecological, social, economic and technical standards, promotion of this technology involves discouraging the use of chemical fertilizers, pesticides and other synthetic inputs in lieu of the practice of soil fertility management, varietal breeding and selection under chemical and pesticide-free conditions, and the use of ecologically sound biotechnology

and other cultural practices, among other things. Such ideas are still relatively new to farmers who, with much credit to the "Green Revolution" campaigns in the seventies, have long been oriented to high-yielding farming technologies that used synthetic fertilizer and pesticides. LGUs considering organic farming promotion that is aligned with the OAA face a new policy that entails a substantial shift from a productivity-focused farming technology to one that places greater emphasis on sustainability.

Declaring the national government's commitment to the practice of organic agriculture, the OAA calls for the development and dissemination of organic farming technology through the National Organic Agricultural Program (NOAP) and the formation of local technical committees (LTCs) at the provincial and municipal levels for the implementation of NOAP. Creation of LTCs indicates a decisive move of LGUs to align themselves with this new national policy agenda and thus the inclusion of organic technology into the local government's menu of agricultural services. Like most of their counterparts in the rest of the country, municipalities in Bohol have yet to signify formal commitments to the OAA through local policies that promote organic farming in their respective jurisdictions. At the time of the study, official reports show that only about 20 percent of municipalities in the country and none of the municipalities in the study area of Bohol have formed LTCs in accordance with OAA guidelines (DA, 2012). Consistent with this account, none of the municipalities in Bohol have passed a local ordinance to formally align with RA10068 or launched a full campaign that promotes organic farming. Local initiatives to promote the technology are few and more exploratory in character. Despite the seeming sluggishness of OAA's progress in the LGUs, the presence of relevant discourse and tentative local moves to promote organic farming in Bohol suggest

that the local policy process has already commenced. A few observations suggest mounting relevance of organic farming promotion in the awareness of LGU officials in Bohol. For instance, the provincial government has already initiated discourse about the promotion of organic farming across Bohol (Chatto, 2011). A welcome progress can be seen in the on-going effort of Bohol Integrated Area Development (BIAD) V, an economic cluster of rice producing municipalities, to position themselves in the organic rice market (LGSP-LED, 2013). Furthermore, from 2009 to 2010, several municipalities have reported embarking on activities that involve use of organic technology such as government-run vermiculture composting projects and promotion of backyard vegetable farming (LGPMS, 2013).

At this relatively early stage in the dissemination of OAA for local government take-up, the appropriate issue concerns how local officials' attitudes toward the prospective policy are being shaped by on-going policy transfer processes. Understanding "attitude" as a psychological tendency to favor or disfavor an entity (Eagly & Chaiken, 1998), this study defines policy attitude as the outlook or the degree of receptiveness toward a policy. It is determined from expressions of perceptions about the policy's benefits. In the same way that attitudes are considered crucial to the success of innovations in information systems (Rice & Aydin, 1991 citing Lucas), the attitudes of key officials also have some bearing on the successful adoption and implementation of policy innovations. With their authorities strengthened by the decentralization reforms in the past two decades, mayors are the most influential public official in Philippine municipalities. The mayor provides executive leadership over the daily affairs of the LGU and exerts much influence in the work of the local legislative council through

powers of veto, agenda-setting and persuasion. Such leadership style, dubbed as the "command and control" model (DAP, 2005), makes a mayor's' policy attitude essential to the successful adoption and implementation of local policy innovations.

This study probes the role of mayors as agents of ideas along with the network mechanisms that enable them to communicate policy information across municipal boundaries. The attention given here to the embeddedness of the mayor in social networks is premised on this LGU official's critical role as agent of ideas for policy making. After all, mayors are both users and sources of information about local policy issues. This agency role for policy ideas is one of the elements included in Campbell's (2002) proposed approach to unraveling causal processes between ideas and policy outcomes. The networks of a mayor's interactions with other mayors serve as channels through which relevant information about policy is exchanged, thereby embodying another component of Campbell's approach--- the mechanisms that enable communication of policy ideas. This study applies the network perspective in its investigation of how mayors' policy attitudes of toward the promotion of organic farming may be socially influenced through social network exchanges. It employs social network analysis (SNA) to characterize each mayor's embeddedness in their provincial network. It proceeds to determine the influence of different measures of embeddedness on the incidence and extent of similarities between a mayor's policy attitudes and those of his fellow mayors, both in the entire network and in the network of his immediate ties--- his ego network.

This study highlights the value of tapping social networks of mayors for the dissemination of national government initiatives, which in this case is the accelerated

LGU take-up of the OAA. Moreover, it implements a unique take to the research on policy transfer in terms of at several aspects. First, unlike the usual focus on policy actions as objects communication and learning mechanisms, it concentrates on the attitudes of mayors as targets of socially influenced policy learning. Policy attitudes are less obvious than policy actions but being able to explain how the former is influenced by transfer mechanisms provides insight into how the latter ultimately evolves through the process. Consideration of policy attitudes hence contributes to the understanding of the less noticed but just as relevant intermediate outcomes of the policy transfer process. Secondly, this study highlights the value of social influence in the process of policy transfer as it adopts the network approach to characterize the social system of mayors, and associates network embeddedness traits of these officials to similarities in their policy attitudes. Such focus on social influence makes it one of the first local policy process studies to adapt the social information processing theory much used in organizational innovation research (Salancik & Pfeffer, 1978; Rice & Aydin, 1991). Furthermore, this study collected social network information that accommodates measurement of a wider range of embeddedness characteristics. In the measurement of network prominence, it used the mayors' own assessments of "strong ties" and positive regard for peers that were derived directly through a survey. It was also able to characterize structural hole traits of mayors' ego networks that are relevant to the information exchange and policy attitude similarities. Finally, this study provides a decentralized developing country perspective to the inquiry on policy transfer processes. Earlier works on policy transfer are criticized for tendencies toward pluralist assumptions (Dolowitz & Marsh, 1996). Such assumptions do not always apply to subnational

governments in countries like the Philippines, despite them having gone through decentralization reforms due to differences in political structures and institutional settings. Benson and Jordan (2011) note that empirical bias toward industrialized country settings has hindered deeper understanding of the structural factors to the process.

The next section, which reviews related works on policy transfer, social learning and the network approach, is followed by the presentation of the theory and hypotheses of this study. Operationalization of attitudes and embeddedness measures are then described with the analytical design. The final sections discuss results of the analyses, final thoughts on the implications for policy and direction of future research.

3.2 Related Literature

Although policy transfer does not always lead to exact emulation, it embodies how policy goals, content, instruments, programs, institutions, ideologies, ideas and attitudes, and even negative lessons in one polity become external inputs to the formulation of policies in another (Dolowitz & Marsh, 1996; 2000). The breadth of studies that have already been devoted to policy transfer has expanded over time and the research continues to evolve and open up more opportunities for extended inquiries and empirical contexts (Benson & Jordan, 2011). This study performs one such extension.

The body of research covering domestic and transnational policy transfer and diffusion has grown very much in the past half century (Graham, Shipan & Volden, 2008). Policy diffusion, which generally refers to policy adoption patterns arising from communication or transfer processes between polities, has been applied in numerous policy innovation studies on the US federal system (Walker, 1969; Gray, 1973; Grupp & Richards, 1975; Berry & Berry, 1990; Balla, 2001; Volden, 2006, among others) as well

as in domestic contexts of other countries (Ito, 2001; Sugiyama, 2008; Shi, 2012). The field of international relations has also utilized the framework of policy diffusion (Dobbin, Simmons & Garrett, 2007; Cao & Prakash, 2010). In the studies cited here, policy transfer is depicted as one of the main determinants of diffusion, with some citing personal interactions between key government officials as channels of emulation (Walker, 1969; Gray, 1973; Grupp & Richards, 1975; Balla, 2001). However, these diffusion studies do not elaborate on the social mechanisms behind the policy transfer process involved (Mintrom, 1997; Mintrom & Vegari, 1998).

Policy transfer studies particularly cover the exchange and processing of information about policies in one setting for policy making in another setting (Dolowitz & Marsh, 1996). Policy transfer often happens through voluntary emulation due to learning and in some cases, leadership emulation (Grupp & Richards, 1975). This strand of research is closely related to the study of policy diffusion in terms of how it highlights the relevance of interdependencies between neighboring political systems. In explaining policy transfer among British local authorities in terms of their individual embeddedness in the intergovernmental community, Wolman and Page (2002) note the influence of neighbors on a jurisdiction's policy making. These neighbor-effects are incorporated in organizational institutional theory which cites coercive, normative and mimetic pressures as determinants of isomorphic patterns in organizations (DiMaggio & Powell, 1983). Policy transfer however departs from policy diffusion as it focuses less on the transmission of a policy in its entirety and more on the transfer of information that shape individual policy actions (Dolowitz & Marsh, 2000). It has typically been investigated cross-nationally and even includes a wider array of actor-agents in supranational

organizations and transnational government levels (Dolowitz, 2003; Jones & Newburn, 2006; Kwon, 2009; Stone, 2012, among others).

In Benson and Jordan's (2011) recent survey of literature on policy transfer, they note how research has evolved to encompass different perspectives and foci. Not only have inquiries ventured into more specific aspects of policy transfer mechanism like roles of policy actors, motivations and contents, but more recent works (as with Knill, 2005) have also used the concept of policy transfer to explain convergence of policies. Benson and Jordan also cite opportunities to merge the concept of policy transfer with various theoretical concepts in the scholarship. This study is one likely prospect as it combines the concept of policy transfer with network-facilitated social learning to explain similarities in policymakers' attitudes. Given its narrow focus, very little work has so far been done to directly address this study's object of inquiry. A few samples of related those research are discussed henceforth.

With regard to explaining interdependent attitudes, the research on information systems adoption has investigated the impact of a few related factors. Some studies consider the effect of one's perception of others' attitudes on actual attitude toward an innovation (Svenning, 1982; Steinfield, Jin & Ku, 1987). Others explore how shared culture and norms could explain the similarities of one's attitude with those of the others in the organization (Nosek, 1989; Davis, Bagozzi & Warshaw, 1989). Rice and Aydin (1991) bring in the network perspective in explaining attitude interdependence within an organization. As they apply the social information processing theory (Salancik & Pfeffer, 1978), they focus on network-based mechanisms, arguing that an individuals' attitude toward an information system is influenced by the attitudes of one's most frequent

contacts. Their work demonstrates the utility of the network approach in explicating the mechanisms and sources of socially influenced learning in the context of organizations.

Studies on information systems adoption, along with other samples from innovation research (Inkpen & Tsang, 2005; Ahuja, 2000; Powell, Koput & Smith-Doerr, 1996) substantiate the gaining popularity of the social network approach in explaining interdependent attitudes in different organizational settings. The approach also seems to be particularly useful to studies about policy innovation via transfer processes since social networks can serve as conduits of policy learning between neighboring jurisdictions (Wellman, 1983; Rogers, 2003; Adam & Kriesi, 2007). Several studies have applied the concepts of embeddedness and social capital to competitive advantage (Uzzi, 1996; Moran, 2005; Schalk, Torenvlied, & Allen, 2010). Particularly for some studies on performance and knowledge transfer, focus given to the relevance of tie strength within networks (Granovetter, 1973; 1982; Burt 1992; Krackhardt, 1992; Hansen, 1999).

In his examination of the relationship between the structural embeddedness of mayors and policy isomorphism in Danish municipalities, Villadsen (2011) provided support for the influence of social learning and networks on policy choices within the community of subnational governments. Villadsen argues the role social networks as conduit of information, expectations and pressures, which in turn guide policy choices making up policy convergence patterns. His application of the social network approach provides a very useful and interesting addition to the understanding of policy innovations. However, his results are limited to explaining only formal interactions based on mayors' memberships of different organizations, committees and boards. While organization-based activities provide mayors with opportunities to discuss work-related issues and

governance strategies, solely focusing on those types of ties would tend to ignore the less formal means of communication and social learning. In the socio-cultural context of the Philippines, informal or personal ties are just as significant as formal ties in fostering information transfer among officials; sometimes, the lines are blurred by pre-existing and evolved kinship. Additionally, the work of Villadsen is limited to explaining convergence patterns for discrete policy choices. Its findings can therefore only speak to the social mechanisms of policy learning that actually lead to adoption of policies. Given the choice of dependent variable, network effects on policy learning that did not culminate to discrete policy choices are ignored in the analyses.

This study sets out to extend the empirical context of the research on local policy transfer, not just to the Philippine municipal government setting, but also in the application of a wider set of embeddedness concepts in its application of the network approach. Through the use of survey method in gathering information about mayors' relations, it was able to derive more specific types of ties such as "strong ties" based on each mayor's self-reports of most frequent interactions, as well as directional ties of positive regard based on reports about the most respected mayor-peer. With such alternative operationalization of network ties, the use of different measures of prominence, and the incorporation of structural hole traits in the analyses, more aspects of embeddedness than has been in previous works are examined here. Moreover, this study observes policy transfer through a cognitive measure of policy attitude, a more direct result of policy transfer facilitated through socially networked communication mechanisms though a less popular object of inquiry.

3.3 Hypotheses

The social information processing model posits that the social environment is an important source of information and normative cues for forming individual attitudes (Salancik & Pfeffer, 1978). Along the same line, this study generally argues that social relations have a significant bearing on local policy learning and transfer processes such that embeddedness in the social network can influence the incidence and extent of similarities between a mayor's policy attitudes and that of his mayor-peers in the province. Be it due to coercive, normative and mimetic pressures or lesson-drawing (DiMaggio & Powell, 1983; Rose, 1993), policy attitudes among interacting local officials are expected to become more alike. Researches on policy diffusion (as reviewed Berry & Berry, 2007) and a more recent study on policy isomorphism (Villadsen, 2011) refer to such dynamics in explaining adoption behavior arising from socially mediated influences from other jurisdictions.

Most valuable in elucidating the mechanism of social influence on policy attitudes is the social network perspective. Formal and informal mayoral ties make up a social network in which knowledge, beliefs, values and norms are exchanged between mayors through (Pfeffer & Leblebici, 1973). In this study, attention is directed at the traits that characterize a mayor's embeddedness in social networks. Embeddedness has been largely applied to how economic behavior is influenced by social relations (Granovetter, 1985) although later on, the concept became popular in organizational research as determinant of exchanges and performance (Borgatti, 2003). In the simplest sense, embeddedness refers to an actor's position in a social network brought about by repeated interactions with other actors. It is generally argued here that embeddedness of mayors in the social

network affects how policy-related information are transferred and processed by these LGU officials. Such influence eventually manifests in the incidence and extent of similarity between a mayor's attitude and the collective attitudes of his fellow mayors in the broader network as well as in their respective ego networks. This argument is tested in terms of the two groups of embeddedness measures: a mayor's network prominence in the broad network and the structural holes in a mayor's ego network.

Prominence refers to one's visibility to other actors in the network and is differentiated into centrality and prestige (Knoke & Burt, 1983; Wasserman & Faust 1994). Centrality is an actor's degree of involvement with other actors in the network regardless of whether or not he is an initiator or receiver of that relation. On the other hand, prestige is the degree to which one is at the receiving end of positive social relations. The first four hypotheses tested here distinguish the influence of these two concepts of mayor prominence in the social network.

Centrality indicates a position of advantage since connection to more people gives an individual more opportunities for gainful exchange. It also determines the one's access to information as well as the speed by which information can be accessed. Being more central in the network also connotes greater opportunities to transmit information to other actors. One of the hypotheses that this study tests is whether mayors who have more relational ties in the network are expected to be so exposed to and involved in greater traffic of information that their attitudes with regard to the new policy become more similar to those of other mayors in the network.

3.3.1 The policy attitude of a more centrally positioned mayor will more likely become similar to those of the other mayors in the network.

3.3.2 The policy attitude gap between a more centrally positioned mayor and other mayors in the network will be smaller.

Four different measures of centrality were applied in the analyses. Among these, degree centrality has the advantage of simple of computation and interpretation as it pertains to the number of an actor's direct interactions with other network actors (Borgatti & Halgin, 2010). By this measure, the central actors are those who have access to the most information channels. On the other hand, closeness centrality indicates how much an individual is far away from the others in the network. By this measure, the importance of the mayor's central position in the network is with regard to how communication could be done with as little reliance upon intermediaries as possible. Closeness centrality is however only meaningful for connected graphs because single nodes in unconnected graphs register infinite distances from other nodes in the network. Alternatively, betweenness centrality approximates centrality even for unconnected graphs. This measure indicates a mayor's role in controlling or mediating relations between other non-adjacent mayors in the network. It is the "extent to which other actors lie on the shortest path between two actors in the network" (Knoke &Yang, 2008, p67). It reveals an actor's interpersonal influence (Freeman, 1979; Friedkin, 1991), control over communication and resources (Knoke & Yang, 2008), and gate-keeping roles (Wasserman & Faust, 1994). Finally, the Bonacich centrality is a modification of degree centrality and considered superior (Hanneman & Riddle, 2005). It is basically determined by the number of an actor's connections as well as the number of connections of those with whom he is connected. It takes into account both positive and negative exchange systems. It is usually equated with power in positive exchange systems where having

well-connected neighbors improves an actor's access to information as well as ability to transmit the same. In exchanges however, the same idea of centrality leads to a less advantageous position. Connection to well-connected neighbors means dealing with actors who have access to many alternative exchanges, thereby reducing one's bargaining power. In this study, the influence of Bonacich centrality is tested particularly for information exchanges. Hence, the influences of this centrality measure, along with those of the other three measures of centrality, are expected to be congruent with the above-stated hypotheses.

Prestige in the network of mayors connotes the favorability of the mayor's position as an object of attention and deference. This measure is closely related to the concept of power, which is inherently relational and a consequence of relationships (Hanneman & Riddle, 2005). It provides an actor with opportunities to exert social influence on fellow actors in the network. In market exchanges, prestige is used as signal of quality and thereby guides investment and exchange decisions when information about the market is imperfect (Podolny, 1993). An actor who enjoys a status of prestige can be an object of emulation and a trusted conduit of ideas by peers. This study therefore tests whether prestige enables mayors to be more effective senders and conduits of information such that they exhibit policy attitudes closer to that of other mayors in the network.

3.3.3 The policy attitude of a mayor who has a status of prestige in the network will more likely be similar to those of the other mayors.

3.3.4 For a mayor who has a status of prestige in the network, his policy attitude gap from the other mayors will be smaller.

A mayor's ties in the network determine the social capital available to him. Social capital is a resource emanating from relationships between actors which they can use to pursue individual goals (Baker, 1990). It is seen as a form of advantage that usually leads to economic gains when strategically applied (Burt, 2000). Interacting actors are perceived to share the ownership of social capital in the sense that benefit from any connection is contingent on the willingness of the other party to stay in that relationship (Burt, 1992). Joint ownership of a relationship however does not automatically mean that both parties have equal levels of social capital. Between two interacting actors, the difference in the amounts of their respective social capital can also depend on the extent of reciprocity in the relation. In this study, I specify a mayor's social capital as the advantage of access to information that would draw his policy attitudes closer to those of other mayors.

Social capital is usually associated with the strength of ties, which based on the frequency of interactions. Strong ties, which indicate the most frequent and closest relations, are expected to exhibit greater cohesion with between actors as a result of repeated interactions. On the other hand, weak ties have been associated with bridging roles to crucial information in the network (Granovetter, 1973). Burt (1992) qualifies the observation of the bridging role of weak ties and proposes the agency of structural holes to explain the conditions responsible for information benefits from bridges between subgroups within a network. Burt defines structural holes as the absence of ties or a relationship of nonredundancy between an actor's contacts, yielding additive rather than overlapping benefits. He argues that the individual who has ties (strong or weak) that reach over structural holes is at a greater advantage than other actors in his subgroup

when it comes to obtaining information from other clusters or subgroups of actors in the network. On the other hand, the fewer structural holes or the prevalence of redundant ties within a subgroup could also be perceived to generate shared social capital. Redundant ties enable multiple access to information flowing within the subgroup, which eventually leads to shared knowledge and attitudes. This study investigates such influences of structural holes in mayoral ego networks on a mayor's advantage in accessing information as manifested in policy attitude similarities of a mayor with those of other mayors in the entire network as well as within the ego network.

With regard to obtaining access to information beyond one's subgroup, a mayor's social capital is derived from having more structural holes within his ego network. Having non-redundant ties the ego network enhances a mayor's exposure to information exchanges in the broader network. These ties can serve as bridges to information from other mayor clusters or subgroups in the broader network. Lower redundancy in a mayor's ego network also means that this LGU official is not constrained to the information flow within the subgroup. Structural hole traits of a mayor's ego network that indicate these social capital gains are thus expected to improve policy attitude similarities of the mayor with those of other mayors in the entire network.

3.3.5 The policy attitude of a mayor whose ego network has more structural holes will have greater odds of becoming similar to the attitudes of other mayors in the entire network.

3.3.6 For a mayor whose ego network has more structural holes, the gap of his policy attitude from those of the other mayors in the entire network will be smaller.

With regard to enhanced access to information within one's subgroup, a mayor's social capital is derived from having fewer structural holes within his ego network. Fewer structural holes imply that the mayor has more connections who are themselves interacting with each other. Social capital is higher in such an ego network where redundant ties give way to uninterrupted flow of information as there are more alternative means of access to one contact (Burt, 2001). When one's contacts share ties with each other, it can become difficult to completely eliminate a mayor's connection to a particular contact even if his direct ties to that individual were cut off. Redundancy becomes a constraining property as more of the same set of information flows in. Other forms of social capital that can be associated with this kind of ego network are the improved levels of trust, norms, reciprocity and other values, which serve both the information and material exchanges among the actors (Putnam, 1995; Coleman, 1988; Granovetter, 1985). As this study tests, fewer structural holes in a mayor's ego network will result in greater similarity in policy attitudes between mayor and his immediate contacts.

3.3.7 The policy attitude of a mayor whose ego network is characterized by fewer structural holes will have greater odds of becoming similar to the policy attitudes of other mayors in his ego network.

3.3.8 For a mayor whose ego network is characterized by a fewer structural holes, the gap of his policy attitude from those of the other mayors in his ego network will be smaller.

3.4 Methodology

The hypotheses were tested using cross-sectional data provided by Boholano mayors who participated in the social network and perception survey in 2012. Initially, survey instruments were sent out to mayors in all 47 municipalities in Bohol. These were followed by visits to the municipalities which yielded a total of 24 completed interviews.

In the survey, respondents provided demographic and professional information, as well as self-assessments of their social interactions with fellow mayors in the province. They also shared their perceptions about the benefits of organic farming and its promotion in their localities. The survey data was augmented with information from the provincial and national government websites.

3.4.1 Dependent Variables: Policy Attitude Similarities and Gaps

Policy attitude is defined here as the level of a mayor's receptiveness toward the prospective local policy of organic farming promotion. It is denoted in terms of five major categories, which were constructed from the aggregation of the twelve perception statements about organic farming in the survey. Statements about perceived benefits of organic farming were aggregated into three main categories: environmental and health benefits, economic or income benefits, and combined environmental, health and income benefits of the technology. Statements pertaining to perceived municipal government's motivations for adoption of the policy were reported under the aggregated category for political motivations. Finally, an over-all measure of policy attitude toward the promotion of organic farming was created.

Measures of policy attitudes were drawn from the Likert-scale responses of the respondents indicating their levels of agreement to the twelve statements in the survey. The mayors were asked to express their responses on seven-point grades representing *Strongly Disagree, Disagree, Somewhat Disagree, Undecided, Somewhat Agree, Agree and Strongly Agree*. After finding little variation in the intermediate response grades and for ease of interpretation, the original scale was condensed to a five-point scale in which *Somewhat Disagree* responses were combined with *Disagree* responses while *Somewhat*

Agree responses were joined with the *Agree* responses. To quantify mayors' policy attitudes, corresponding response scores for survey statements aggregated under each category were averaged. The over-all policy receptiveness score is hence the mean of the response scores in all twelve survey statements.

A binary variable was created to indicate similarities in each policy attitude category. Mayors whose policy attitudes fell into the same category as the average of their peers were assigned a value of "1" for similarity and "0" otherwise. Different sets of values for this variable was determined for entire network and ego network similarities.

In each of the five categories, a mayor's policy attitude score was then compared to the average of attitude score of his peers in the entire network as well as those in his ego network. From these comparisons, the absolute values of policy attitude gaps between a mayor (i) and with his peers (j) were derived through the formula in Equation 3.1. Both the similarity and gap variables were estimated in the subsequent analyses.

$$Policy\ Attitude\ Gap\ (i) = Attitude(i) - [\frac{1}{n-1}\sum_{j\neq i} Attitude(j)] \qquad (3.1)$$

3.4.2 Independent Variables: Mayor's Centrality Measures

In the network map that was drawn from the survey data, each tie exists if either party names it as one of his most frequent interactions. Such information is based on mayors' responses to the question asking them to name a maximum of three other mayors with whom they most frequently interact. Given the phrasing of the question, the relations identified by each respondent are his strong ties. The use of fixed number of choices in social network surveys is criticized for the risk of introducing measurement errors in the analysis of some network properties of subgroups (Wasserman& Faust,

1994). However, this study makes an exception for two reasons: 1) letting respondents name more than one mayor-cohort provides for existence of equally frequent relations, and; 2) limiting the responses to a maximum of three compels the respondent to make an effort to first assess their ties and identify the most relevant cohorts of all the mayors in the province. As to whether a response limit greater than three would have excluded some relevant ties, this did not turn out to be a concern in the survey since only one of the respondents named three ties. Four measures of centrality were derived from these self-assessed reports of interactions: degree, closeness, betweenness and Bonacich.

3.4.2.1 Degree Centrality

Wasserman and Faust (1994) first define degree-centrality index, C_D(i), in the form of Equation 3.2 .

$$C\_D(i) = deg(i) \qquad (3.2)$$
$$deg(i) = x_{i+} = \sum_j x_{ij} = \sum_j x_{ji}$$

In Equation 4.2, degree centrality for actor "i" is determined by the sum of direct ties with all other actors. Centrality score is computed by adding up cell entries in either row or column of actor i's symmetric data matrix. To account for the effect of group size (g) on this measure, Wasserman and Faust subsequently propose the standardized version, C'_D(i), in the form of Equation 3.3. The formula divides the degree centrality score by the maximum number of possible connections with other actors in the network $(g - 1)$ and is interpreted as the proportion of actors (except "i") adjacent to actor "i" to the total number of other actors in the entire network. This standardized measure of degree centrality is used in this study.

$$C'\_D(i) = \frac{\deg(i)}{g-1} \quad (3.3)$$

3.4.2.2 Closeness Centrality

The simplest way of measuring closeness centrality is through the index developed by Sabidussi (1966). As shown in Equation 3.4, the index is equivalent to the inverse of the total distance ($d(i,j)$) to all other actors in the network. A standardized version for ease of comparison between networks of different sizes was subsequently proposed and is presented in Equation 3.5 (Wasserman & Faust, 1994 citing Beauchamp). This measure can also be viewed as the inverse of the average distance between actor i and the other actors. Ucinet uses the term, average reversed distance (ARD) to refer to this closeness centrality measure.

$$\text{C\_C(i)} = [\sum_{j=1}^{g} d(i,j)]^{-1} \quad (3.4)$$

$$\text{C'\_C(i)} = (\text{g-1})\,[\sum_{j=1}^{g} d(i,j)]^{-1} \quad (3.5)$$

3.4.2.3 Betweenness Centrality

Freeman (1977) first proposed the formula in Equation 3.6 for the computation of this centrality measure, which is the sum of the ratios of the shortest paths or geodesics between actors j and k containing actor i to the total number of geodesics between actors j and k. Standardizing this measure by the maximum value of $\frac{(g-1)(g-2)}{2}$ yields the formula in Equation 3.7.

$$C\_B(i) = \sum_{j<k} \frac{g_{jk}(i)}{g_{jk}} \quad (3.6)$$

$$C'\_B(i) = \frac{C\_B(i)}{[\frac{(g-1)(g-2)}{2}]} \quad (3.7)$$

3.4.2.4 Bonacich Centrality

In an earlier specification (Equation 3.8), Bonacich centrality (e_i) is equated with the sum of all connections to other actors in the network (R_{ij}) weighted by the centralities of those other actors (e_j) (Bonacich, 1972). Bonacich (1987) later proposes a more flexible formula (Equation 3.9) to accommodate the different forms of relations. In the recent specification, he introduces a parameter, β, to account for the degree and direction of dependence between actors.

$$\lambda e_i = \sum_j R_{ij}\, e_j \qquad (3.8)$$

$$C_i(\alpha,\beta) = \sum_j (\alpha + \beta c_j)\, R_{ij} \qquad (3.9)$$

In Equation 3.9, α is used as a determinant of vector length while β is used to represent the extent to which the centralities of other actors determine an actor's status in the network. The sign of β is contingent on the type of relations being studied. A positive value is assigned to β in information exchange networks because the higher status of one's neighbors improves his access to information. A negative value is applied in bargaining relations when exchange with the actor is precluded by the higher statuses of his neighbors who have access to more alternative deals. The magnitude of β, which ranges from zero to one, indicates the extent to which centralities of an actor's neighbors could be taken into account. Increasing value of β indicates greater consideration of neighbor centralities, which is essentially the effect of indirect ties along with direct ties to an actor's centrality in the network. This study assumes a positive β value since it is more focused on the dynamics of information exchange. A magnitude of β equivalent to

0.44 is used here based on the recommended value equivalent to 0.5% less than the maximum possible weight.

3.4.3 Independent Variables: Mayor's Prestige Score and Status

Based on the definition in Wasserman and Faust (1994), prestige score is simply the sum of indegrees for an actor (Equation 3.10). The formula shows that principle of measuring prominence in terms of prestige score is only differentiated from that of degree centrality score by its application to directed ties. To account for the effect of network size, prestige is similarly standardized by the maximum number of possible connections with other actors in the network (Equation 3.11).

$$P(i) = deg(i) = x_{+i} \qquad (3.10)$$

where deg(i) is the indegree of actor i

$$P'(i) = \frac{x_{+i}}{g-1} \qquad (3.11)$$

Using information drawn from responses to the survey question, "Is there a municipal mayor in the province whose opinion you value most in terms of policy and program implementation decisions?", prestige scores were computed based on the standardized formula in Equation 3.11. Only about half of the respondents were nominated and there was very little variation in the computed prestige scores of those who were named as such. While the scores were useful in preliminary comparisons of the mayors' prominence in the network, it appears that the best way to test the influence of prestige on policy attitude gaps and similarities is by operationalizing it as a status. Prestige status is hence defined as a binary valued variable representing a position that

enjoys any level of positive regard from other mayors in the network. This variable is assigned a value of "1" if a mayor has a non-zero prestige score and "0" if otherwise.

3.4.4 Independent Variables: Structural Hole Traits of Mayors' Ego Networks

The structural hole traits of the surveyed mayors' ego networks that were measured in this study are those considered to indicate the type of social capital applicable to the two levels of attitude comparison: 1) similarity with other mayors in the broader network and 2) similarity with mayors in the ego network. These measures mainly characterize the extent of a mayor's redundant connections and constraining ties. The first group of traits depicts the extent of connections in a mayor's ego network: redundancy, effective network size and efficiency. The second set includes the measures of constraint and hierarchy. These traits and the methods used in their measurement are described in the following subsections.

3.4.4.1 Redundancy

Based on Burt's (1992) definition, redundancy for an actor i's ego network is through Equation 3.12.

$$Redundancy\ (i) = \sum_q (P_{iq} m_{jq}) \qquad q \neq i, j \qquad (3.12)$$

In the formula, the extent to which actor i's contacts are redundant with other contacts is the sum of the proportional interactions with each alter (P_{iq}) weighted by the marginal strength of each alter's strongest relationship with any other contact of actor i (m_{jq}). Borgatti (1997) notes that Burt's redundancy measure is just the average degree

of the actor's alters (excluding ties to the actor), and it is the same as ego network density, scaled by a factor of n-1. He simplifies redundancy as the sum of ties excluding ties to the ego, multiplied by 2 and then divided by the sum of nodes excluding the ego.

3.4.4.2 Effective Ego Network Size

In Equation 3.13 (Burt, 1992), it is equivalent to the number of immediate neighbors a mayor has minus the average number of redundant ties.

$$\textit{Effective Size (i)} = \sum_j \left[1 - \sum_q (P_{iq} m_{jq})\right] \qquad q \neq i, j \qquad (3.13)$$

3.4.4.3 Efficiency

In Equation 3.14, efficiency of the mayor's ego network is computed as the ratio of the effective size of the ego network to the gross number of the ego's contacts (N).

$$\textit{Efficiency (i)} = \frac{1}{N} \sum_j \left[1 - \sum_q (P_{iq} m_{jq})\right] \qquad q \neq i, j \qquad (3.14)$$

3.4.4.4 Constraint

This study uses the formula for measuring ego network constraint without the assumption of absent primary holes (Burt,1992). Defining proportional strength of relationship as the measure of time and energy invested by mayor on a relation with another mayor, Burt measures this concept as the proportional number of ties to that other mayor. In the equation, the specific constraint exerted by mayor j on mayor i is the combination of the proportional strength of the direct ties between mayors i and j (p_{ij}), and the proportional strength of mayor i's indirect ties to mayor j. The value for this latter term is equivalent to the summed products of the proportional number of ties between mayor i and every mayor q who is different from mayor j (p_{iq}) and the proportional number of ties between mayor j and every mayor q (p_{qj}). This measure can be interpreted

as a constraint on mayor i's entrepreneurial opportunities resulting from his "investments" on relations that lead to mayor j. At the same time, it can also be seen as mayor i's intentional or unknowing dependence on mayor j for navigating opportunities in the ego network. Equation 3.16 indicates that the aggregate constraint on mayor i from within his ego network is the sum of C_{ij} across contacts j. The values derived through this second formula were compared and used in the analyses.

$$C_{ij} = p_{ij} + \sum_q (p_{iq} p_{qj}) \quad , \quad i \neq q \neq j \qquad (3.15)$$

$$C(i) = \sum_j [p_{ij} + \sum_q (p_{iq} p_{qj})] \quad , \quad i \neq q \neq j \qquad (3.16)$$

3.4.4.5 Hierarchy

As with Burt (1992, citing Coleman), this study applies the Cole-Theil disorder index presented in Equation 4.17 to compute this network trait. Hierarchy in mayor i's ego network is equivalent to the sum of the ratio of the constraint from actor j (C_{ij}) to the average level of constraint per contact (*C/N*) multiplied by its natural logarithm, divided by the maximum possible sum.

$$Hierarchy(i) = \frac{\sum_j \left(\frac{c_{ij}}{C/N}\right) ln\left(\frac{c_{ij}}{C/N}\right)}{N \; ln(N)} \qquad (3.16)$$

Where:
C is the sum of constraints
N is the total number of ties

3.4.5 Control and Other Variables

Demographic and political characteristics of the mayor such as age, gender, education, experience in office, political party affiliation and experience in farming and organic farming, were considered in the preliminary analyses. Whether the mayor himself

was an organic technology user was used to control for access to experience-based knowledge deemed to affect the mayor's receptiveness to organic technology and its promotion. Partisanship by way of a mayor's affiliation with the most popular party among the respondents (LAKAS-CMD) was first considered as a control variable but was later dropped upon finding that it neither significantly improved the odds of policy attitude similarities nor narrowed down attitude gaps.

3.4.6 Analysis

Maps of the surveyed mayors' relations were drawn in NetDraw (Borgatti, 2002). The networks maps were made up of ties based on reports of the most frequent interactions with other mayors in the province. In two of the maps, Bonacich centrality and prestige scores for the respondents were also incorporated as node attributes. Red-colored outlines were used to differentiate mayors who were nominated as objects of respect by the respondents. Scores for network embeddedness traits were derived using the SNA tools in Ucinet (Borgatti, Everett & Freeman, 2002) and compared across the respondents.

Typically, regular logistic regression is used to model log-odds of outcomes such as the ones being investigated in this study. The technique however uses the standard maximum-likelihood-based estimator, which depends on asymptotic results and performs poorly for small sample sizes (Cox & Snell,1989). Considering that only 24 cases are being considered here, exact logistic regression, a technique more suited to small sample sizes, was implemented instead. The method is based on permutational distributions of sufficient statistics and is useful in analyzing small binary data with covariates (Mehta & Patel, 1995). Exact logistic regression estimates logistic model parameters referred to as

conditional maximum likelihood estimates (CMLEs). When the dependent variable is completely determined by the data, MLEs and the CMLEs become unbounded so a median unbiased estimate (MUE) is alternatively used (Hirji, Tsiatis, Mehta, 1989). In such a case, the exact logistic regression command in STATA13 (StataCorp., 2013) computes the MUE.

Relationships between gaps in policy attitudes and mayors' embeddedness and other traits were also first examined through simple correlation analysis. This was followed by ordinary least squares (OLS) estimations of the influences of embeddedness traits on policy attitude gaps between mayors and their peers. All these linear estimations were carried out first at the level of the entire network and later at the ego network level.

3.5 Results

Province-wide visits to municipalities in Bohol yielded a total of 24 participants in this study's network and perception survey of mayors. From the distribution of respondents in Table 3.1, the majority (88 percent) of respondents were male. About 58 percent of the mayors were middle-aged (41-60 years) and on their first first-term in office. Almost all (96 percent) of the respondents had a minimum of a four-year college education, with about 38 percent coming from the medical and law professions. In terms of partisanship, half of the mayors belonged to the political party of the previous national government administration, LAKAS-CMD, which is a dominant component of the national opposition block.

Figure 1 is a simple representation of the mayoral social network in Bohol, based on most frequent interactions reported by the 24 respondents who are represented by dark-colored nodes. The white-colored isolates represent mayors who neither participated

in the survey nor were identified by the respondents as one of the peers with whom most interactions are shared. Comparison of prominence scores was limited to the survey respondents. These values are summarized in Table 3.2. Found to be engaged in the most number of relations with other mayors, the mayor of Tubigon registered the highest degree centrality and closeness centrality (ARD). These results indicate that the mayor of Tubigon not only had the most number of direct relations; he also depended least on intermediaries for information access and other transactions. Betweenness centrality scores show the mayor of Tubigon as positioned in the path of the most mayor-pairs, signifying that more direct ties can come with more opportunities for performing mediating roles in the network. On the other hand, the Bonacich centrality scores reveal a different ranking order. Table 2.2 and Figure 1 both show the mayors of Bilar and Alicia as the most central mayors in the network when the connectedness of mayors' peers is considered. The differences in rankings shows the various ways positional advantages in the social network can be meaningfully assessed. It fits with this study's approach of applying the different measures of mayoral embeddedness in investigating the influence of embeddedness on mayors' policy attitude similarities.

TABLE 3.1: Distribution of respondents by individual characteristics. (n=24)

Characteristics	N	%
Gender		
Male	21	88
Female	3	13
Age		
40 and under	3	13
41-50	6	25
51-60	8	33
61-70	5	21
Above 70	2	8
Experience as mayor		
First term (1-3 years)	14	58
Second term (4-6 years)	5	21
Third-fourth term (7-12 years)	4	17
More than four terms (Above 12 years)	1	4
Education Level		
Trade School	1	4
College Degree	14	58
Advanced Degree	9	38
Political Party Affiliation		
Lakas–Christian Muslim Democrats	12	50
Nacionalista Party	8	33
Laban ng Demokratikong Pilipino	1	4
Liberal Party	1	4
Partido Demokratiko Pilipino-Lakas ng Bayan	1	4
Independent	1	4

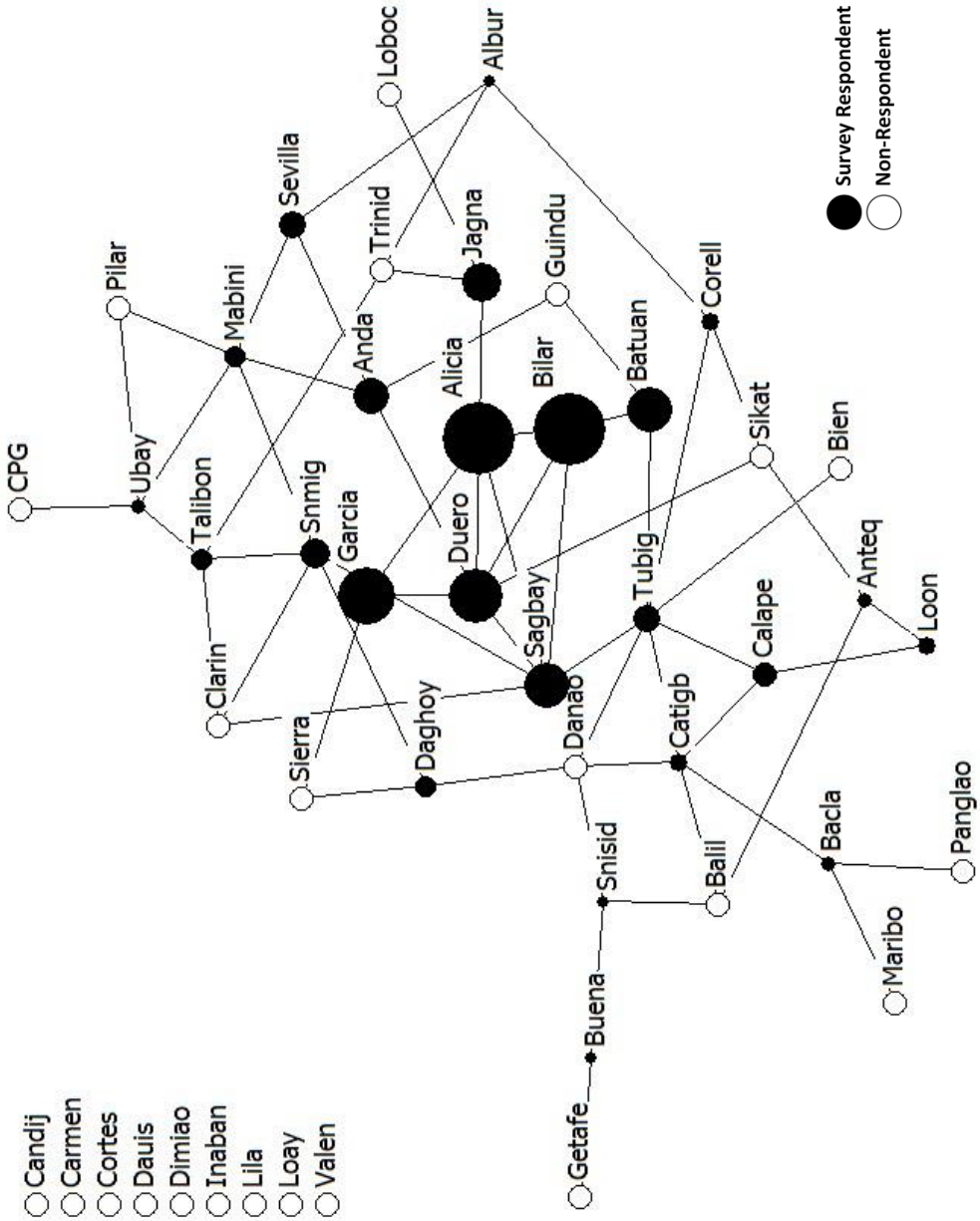

FIGURE 3.1: Social network of surveyed mayors and their peers in Bohol, by Bonacich centrality scores.

TABLE 3.2: Prominence measures based on undirected and directed ties.

	Undirected ties				Directed Ties
Municipality	Degree Centrality	Closeness Centrality (ARD)	Betweenness Centrality	Bonacich Centrality	Prestige*
Alburquerque	0.065	0.304	0.040	0.004	
Alicia	0.109	0.347	0.060	3.269	0.022
Anda	0.087	0.329	0.050	1.264	
Antequera	0.065	0.289	0.029	0.145	
Baclayon	0.065	0.270	0.069	0.177	
Batuan	0.065	0.320	0.028	1.822	
Bien Unido					0.022
Bilar	0.087	0.327	0.011	3.269	
Buenavista	0.065	0.224	0.035	0.014	
Calape	0.065	0.309	0.021	0.673	
Catigbian	0.109	0.350	0.121	0.374	0.043
Corella	0.065	0.329	0.050	0.376	
Dagohoy	0.065	0.320	0.070	0.465	
Danao					0.022
Duero	0.130	0.377	0.081	2.266	
Garcia	0.065	0.296	0.014	2.463	
Jagna	0.065	0.289	0.042	1.459	
Loay					0.022
Loon	0.043	0.255	0.002	0.302	0.022
Mabini	0.109	0.333	0.076	0.561	0.022
Maribojoc					0.087
Sagbayan	0.130	0.392	0.140	1.822	
San Isidro	0.065	0.285	0.072	0.018	
San Miguel	0.109	0.361	0.099	1.024	0.022
Sevilla	0.065	0.298	0.013	0.821	
Talibon	0.087	0.312	0.046	0.465	
Trinidad					0.065
Tubigon	0.152	0.407	0.215	0.818	0.043
Ubay	0.087	0.285	0.042	0.218	0.022

*Based on whether mayor was named as object of respect or admiration with regard to policymaking and leadership style. Includes mayors not in the survey (n=12).

In terms of prestige scores that are also reported in Table 3.2 and illustrated in Figure 3.2 as node size attributes, the mayor of Tubigon was reported by fellow respondents as the most respected, although it was the mayor of Maribojoc, a non-respondent, who was identified as top recipient of this positive regard in the entire survey. A few other mayors who were not part of the survey were likewise identified and included in the reporting of prestige scores. Given very little variation in the prestige scores, use of a binary variable to signify a status of prestige, i.e., whether or not a mayor was named by any of the respondents as an object of respect or admiration, became a more meaningful representation of this type of prominence in the network. This form of the variable was used in the estimations.

Table 3.3 summarizes the structural hole traits of the respondents' ego networks. About one-third of the ego networks formed a center-periphery structure in which the other contacts pass through the ego (see Figures 3.A and 3.D). These ego networks were all composed of non-redundant ties and exhibited optimum efficiency. In this type of network structure, mayors are at the intersection of communication exchange, indicating a position of learning advantage. Although larger network size seemed to generally coincide with higher redundancy, it is the greater extent of structural holes in the structures of some of the relatively larger networks (Figures 3.B and 3.L) that corresponds to higher network efficiency. With the exception of the network triads of non-redundant ties (Figure 3.D), the greater extent of structural holes in the ego networks were also compatible with lower network constraints. None of the hierarchy scores were remarkably extreme to indicate either equal distribution of constraint on all ties or full

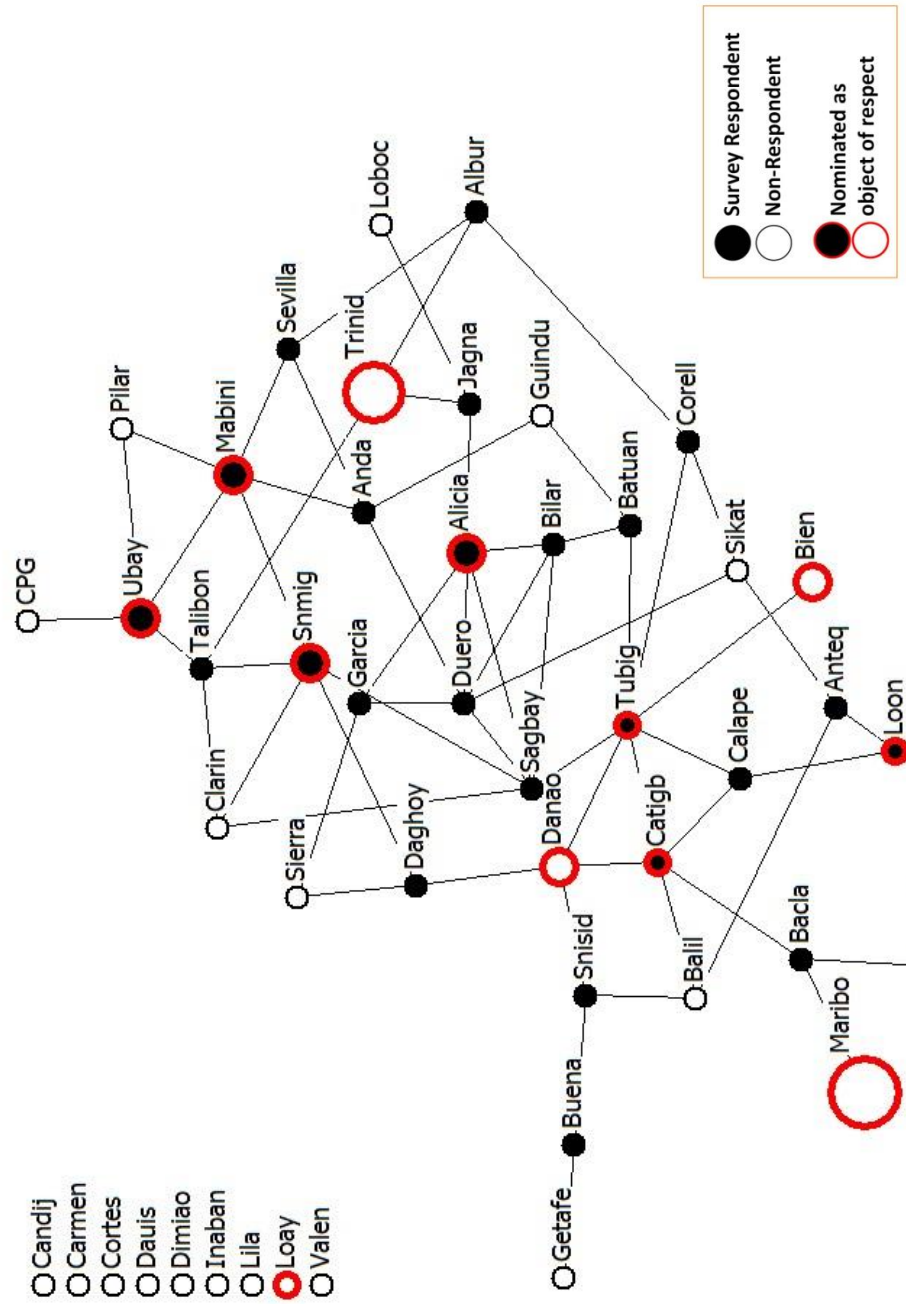

FIGURE 3.2: Social network of surveyed mayors and other peers in Bohol, by prestige status and score.

TABLE 3.3: Structural hole measures for ego networks of surveyed mayors (n=24)

Ego Network	No. of Alters	Redundancy	Effective Size	Efficiency	Constraint	Hierarchy	Shape
Loon	2	0.000	2.000	1.000	0.556	0.278	D
Buenavista	2	0.000	2.000	1.000	0.556	0.278	D
Alburquerque	3	0.000	3.000	1.000	0.333	0.000	A
Antequera	3	0.000	3.000	1.000	0.333	0.000	A
Baclayon	3	0.000	3.000	1.000	0.333	0.000	A
Batuan	3	0.000	3.000	1.000	0.333	0.000	A
Corella	3	0.000	3.000	1.000	0.333	0.000	A
Dagohoy	3	0.000	3.000	1.000	0.333	0.000	A
Jagna	3	0.000	3.000	1.000	0.333	0.000	A
San Isidro	3	0.000	3.000	1.000	0.333	0.000	A
Calape	3	0.667	2.333	0.778	0.611	0.052	C
Garcia	3	0.667	2.333	0.778	0.611	0.052	C
Sevilla	3	0.667	2.333	0.778	0.611	0.052	C
Anda	4	0.500	3.500	0.875	0.406	0.055	B
Ubay	4	0.500	3.500	0.875	0.406	0.055	B
Talibon	4	0.500	3.500	0.875	0.406	0.055	B
Bilar	4	0.857	3.143	0.786	0.571	0.125	F
San Miguel	5	0.750	4.250	0.850	0.387	0.146	K
Catigbian	5	0.800	4.200	0.840	0.382	0.091	G
Mabini	5	0.800	4.200	0.840	0.400	0.023	I
Alicia	5	1.417	3.583	0.717	0.560	0.152	E
Sagbayan	6	1.125	4.875	0.813	0.388	0.072	J
Duero	6	1.214	4.786	0.798	0.432	0.168	H
Tubigon	7	0.500	6.500	0.929	0.227	0.088	L

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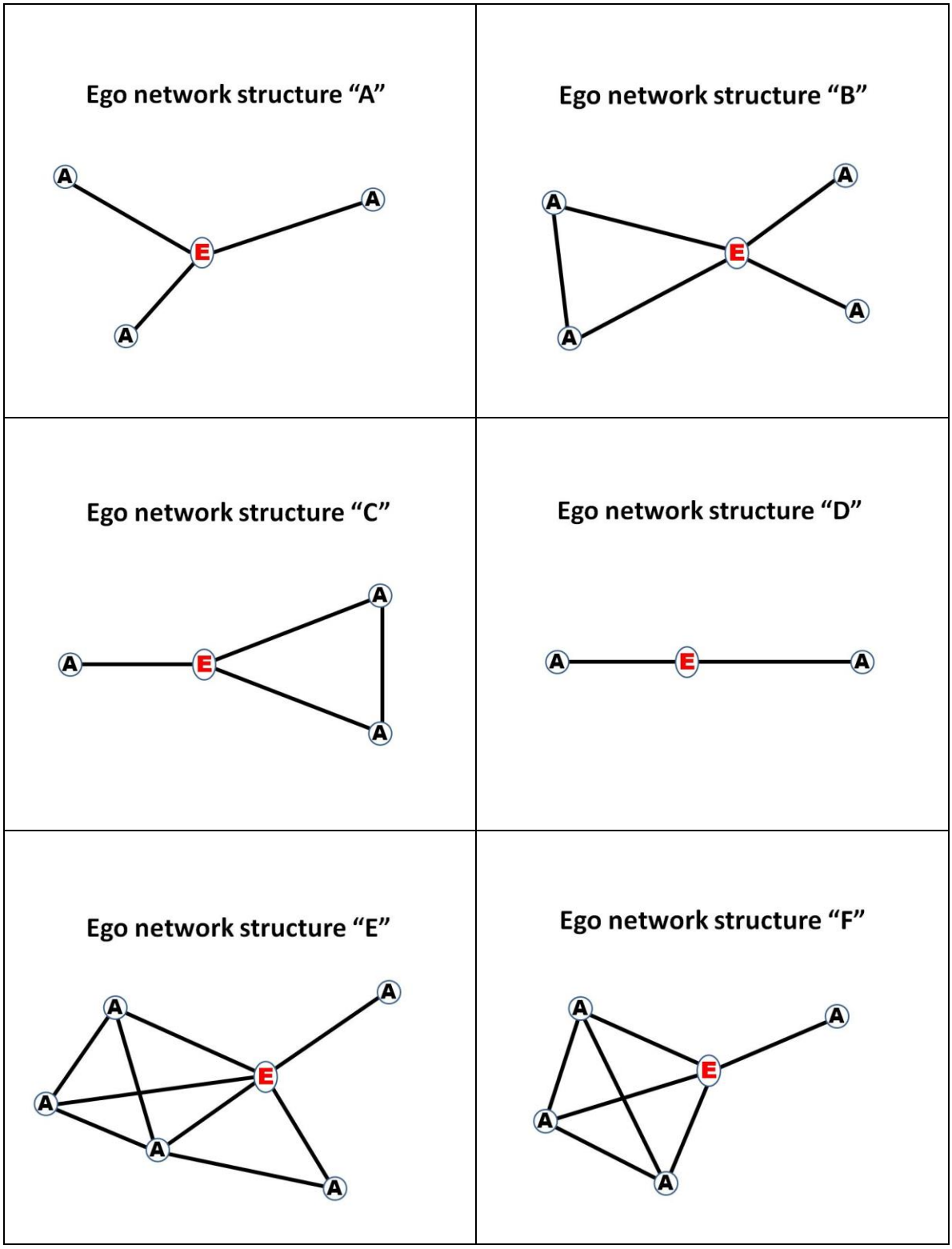

Figure 3.3: Types of ego network structures for surveyed mayors.

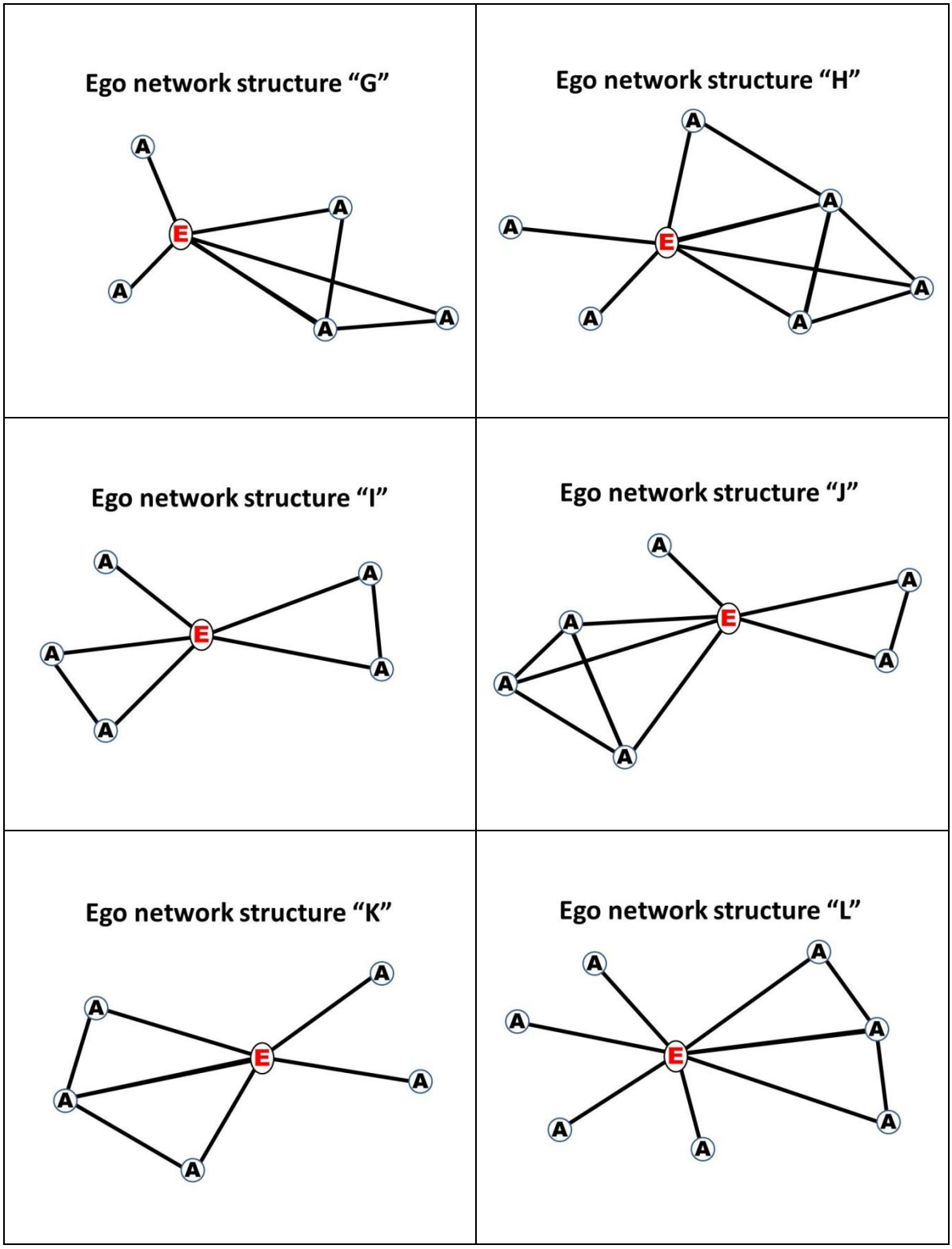

Figure 3.3 (continued).

concentration of constraint on just one relationship. The highest hierarchy score of 0.278 was found for the same triads of nonredundant ties.

Respondents' views about organic farming and its promotion are summarized in Table 3.4. The mayors were generally receptive to the use and promotion of organic farming. Strong agreement was observed highest for statements pertaining to the environmental, health and income benefits of the technology. With regard to perceptions about the other benefits of organic farming, most of the respondents agreed to corresponding statements in the survey. From the distribution of scores across the five policy attitude categories (see Table 3.5), the majority of mayors concur with the perceived benefits of organic farming. Much of the divisions lie between mayors who agree and those who strongly agree with a type of benefit.

As can be observed from Table 3.6, incidences of shared policy attitudes between mayors and their peers were more prevalent in the ego networks than in the entire network. While none of the mayors had the same level of attitude as their peers at the broad network level when it comes to the environmental and health benefits of organic farming, over half of the mayors did so with peers in their ego networks. In terms of economic and combined benefits of the technology and the political motivations for its promotion, the proportion of mayors who shared the same level of attitudes with other mayors in the ego network were consistently higher compared to those of mayors in the entire network. The same pattern holds for over-all receptiveness to the policy, with about 75 percent of the respondents sharing the same level of attitude with other mayors in their ego networks. Such is a snapshot of the extent and quality of information exchange at the time of the survey. The relatively low proportions of mayors who shared

TABLE 3.4: Distribution of mayors' perceptions about organic farming (OF) and its promotion (%).

	Perceptions	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1)	OF benefits soils and the water table.	4	0	0	38	58
2)	OF benefits health of consumers & farmers.	0	0	0	15	85
3)	There is abundant evidence of OF's environmental & health benefits.	4	0	0	38	58
4)	OF offers better income opportunities for farmers.	4	8	0	38	50
5)	OF results to higher farm productivity.	15	8	12	50	15
6)	There is abundant evidence of OF'S economic benefits to farmers.	12	0	4	50	35
7)	There is significant pressure from constituents for the municipal government to promote OF.	15	12	4	50	19
8)	Promoting OF will improve the constituents' level of satisfaction with the municipal government.	4	12	4	58	23
9)	The municipality should promote OF because we know of municipalities that have already succeeded at this.	8	8	0	50	35
10)	OF should be promoted in the municipality to avoid being left behind by other municipalities that might be promoting it soon.	8	8	0	58	27
11)	OF should be promoted to show support to national and/or provincial government's policies on this.	0	8	8	54	31
12)	Given limited resources and competing needs in the municipality, OF promotion CANNOT be a priority.	19	46	4	27	4

TABLE 3.5: Distribution of respondents by level of agreement to perceived benefits of organic farming.

Attitude Category	Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Environmental & health benefits	0	0	0	0	0	0	10	42	14	58
Economic benefits	2	8	2	8	0	0	16	67	4	17
Combined benefits	0	0	1	4	2	8	15	63	6	25
Political benefits of promotion	0	0	4	17	1	4	18	75	1	4
Over-all receptiveness	0	0	1	4	2	8	19	79	2	8

TABLE 3.6: Mayor-respondents with similar attitudes with their neighbors.

Attitudes Toward Organic Farming and its Promotion	Neighbor Group: Other mayors in the entire network		Other mayors in the local network	
	No.	%	No.	%
Environment and health benefits	0	0%	13	54%
Economic benefits	5	21%	12	50%
Combined benefits	14	58%	15	63%
Political motivations for promotion	8	33%	14	58%
Over-all receptiveness	7	29%	18	75%

the same attitudes with other mayors in the larger network level bares the early stage in the process of information exchange and attitude convergence pertaining to the new policy. Since the smaller ego networks had shorter paths compared to the larger network, progress toward shared policy attitudes was visibly faster in the former.

Exact logistic regression models of the incidence of policy attitude similarities at the broad network level are reported in Table 3.7. Estimations at this level excluded perceptions about environmental and health benefits of organic farming because not a single incidence of attitude similarity was found for all the 24 mayors. Of the models,

significant relationships were found only for those pertaining to similarities in perceptions about the combined benefits of organic farming and the political benefits of the technology's promotion. The estimates failed to provide support for the hypotheses about the influences of centrality, prestige and ego-network structural hole traits on the incidence of attitude similarity between the mayor and his peers in the entire network. However, the analyses also produced a couple of unexpected yet very interesting findings.

One finding is the contrarily predicted negative influence of a mayor having a high Bonacich centrality on the incidence of attitude similarity with network peers regarding the combined environmental, health and income benefits of organic farming. The coefficient for this variable was computed as a MUE instead of CMLE since it completely determined the dependent variable. In contrast to the first hypothesis, the expected log-odds of attitude similarity was found to significantly decline by 2.43 for mayors who have relatively more well-connected ties in the network. Such result suggests that being more embedded in the network increases dissonance instead of convergence in knowledge and attitudes. Such a pattern is counterintuitive because greater centrality is expected to provide more opportunities for information exchange, policy learning, and eventually, convergence.

Another finding is the negative effect of the practice of organic farming on the odds of a mayor becoming similar in policy attitudes to other mayors in the network. This variable was used to control for experience-based knowledge that can guide the mayor's attitude toward organic farming and its promotion as a local policy. As a control variable

TABLE 3.7: Exact logistic estimates for the incidence of attitude similarity between a mayor and peers in the network (n=24).

Model	Categories of attitude toward organic farming policy							
	Economic Benefit		Combined Benefits of the Technology		Political Benefit of Promotion		Over-all Receptiveness	
	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio
Model 1								
Degree centrality	0.23	1.26	-0.10	0.91	0.15	1.16	-0.46	0.63
Organic technology use	-0.03	0.97	-1.24	0.29	-2.03	0.13	-0.07	0.94
Model score	0.42		2.34		4.23		1.24	
Model 2								
High degree centrality	0.57	1.77	-0.33	0.72	0.29	1.34	-1.12	0.33
Organic technology use	0.02	1.02	-1.26	0.28	-1.99	0.14	-0.09	0.91
Model score	0.34		2.38		4.11		1.02	
Model 3								
Bonacich centrality	0.21	1.24	-0.55	0.58	-0.29	0.75	-0.30	0.74
Organic technology use	0.00	1.00	-2.11 [i]*	0.12 [i]*	-1.78	0.17	-0.14	0.87
Model score	0.22		3.68		4.40		0.39	
Model 4								
High Bonacich centrality	-0.73	0.48	-2.43 [i]**	0.09	-0.85	0.43	-0.61	0.54
Organic technology use	-0.26	0.77	-2.06 [i]*	0.13	-2.26 *	0.10	-0.09	0.92
Model score	0.56		8.71 ***		4.65		0.48	
Model 5								
Betweenness centrality	0.01	1.01	0.00	1.00	0.01	1.014	-0.01	0.99
Organic technology use	0.00	1.00	-1.71 [i]	0.18	-0.94 [i]	0.39	0.20	1.22
Model score	0.54		2.48		5.96 **		0.31	

TABLE 3.7: (Continued)

Model	Categories of attitude toward organic farming policy							
	Economic Benefit		Combined Benefits of the Technology		Political Benefit of Promotion		Over-all Receptiveness	
	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio
Model 6								
High Betweenness centrality	-0.34	0.71	-0.62	0.54	0.84	2.32	-0.85	0.43
Organic technology use	-0.11	0.90	-1.28	0.28	-1.98	0.14	0.00	1.00
Model score	0.09		2.65		4.64		0.58	
Model 7								
Closeness centrality (ARD)	0.24	1.27	-0.11	0.90	0.13	1.139	-0.08	0.93
Organic technology use	-0.90	0.41	-0.82	0.44	-1.15	0.32	0.29	1.33
Model score	0.92		2.48		4.43		0.12	
Model 8								
High ARD	0.90	2.45	0.03	1.03	0.41	1.51	-0.90	0.41
Organic technology use	0.19	1.21	-1.21	0.30	-1.94	0.14	-0.14	0.87
Model score	0.76		2.27		4.19		0.61	
Model 9								
Prestige	-0.57	0.57	-0.05	0.95	0.71	2.03	-1.10	0.33
Organic technology use	-0.07	0.93	-1.20	0.30	-2.05	0.13	0.08	1.08
Model score	0.25		2.27		4.45		1.02	
Model 10								
Effective ego network size	0.23	1.25	-0.09	0.92	0.35	1.42	-0.36	0.70
Organic technology use	0.09	1.09	-1.62	0.20	-0.96 [i]	0.38	1.17	3.22
Model score	0.28		2.31		4.74 *		0.56	

TABLE 3.7: (Continued)

Model	Categories of attitude toward organic farming policy							
	Economic Benefit		Combined Benefits of the Technology		Political Benefit of Promotion		Over-all Receptiveness	
	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio
Model 11								
Efficiency	-0.03	0.97	0.83	2.29	4.02	55.94	6.31	550
Organic technology use	-0.15	0.86	-1.96	0.14	-1.87 [i]**	0.15	0.36	1.43
Model score	0.01		2.31		4.97 *		1.94	
Model 12								
Ego network constraint	-1.81	0.16	0.61	1.83	-3.32	0.04	-1.40	0.25
Organic technology use	0.00	1.00	-2.44 *	0.09	-2.68 *	0.07	-0.34	0.71
Model score	0.22		2.30		4.97 *		0.17	
Model 13								
Hierarchy	1.83	6.24	4.32	75.54	-0.68	0.50	2.14	8.49
Organic technology use	-0.25	0.78	-1.16	0.31	-2.01	0.13	0.32	1.38
Model score	0.10		2.77		4.04		0.16	

[i] ***median unbiased estimate (MUE)***

**** significant at 10% alpha***

***** significant at 5% alpha***

****** significant at 1% alpha***

for models involving ego network efficiency and constraint measures, it also significantly reduced the odds of attitude similarity on political benefits of technology promotion.

In Table 3.8, the exact logistic estimates for the ego networks confirm the hypothesized influence of one of the embeddedness traits on the incidence of policy attitude similarities between mayors and their network peers. Results indicate that when it comes to perception of organic technology's economic benefits to the farmer, every unit increase in a mayor's betweenness centrality increases the expected log-odds of attitude similarity with fellow mayors in the ego network by 0.03. The effect of this variable, though small, provides support for the initial hypothesis in the study, at least in the context of local networks. It speaks to the mediating role of the mayor in information exchange that culminates into localized convergence in policy attitudes.

Exact logistic regressions at the ego network level also showed the negative influence of Bonacich centrality on the expected log-odds of a mayor agreeing with their immediate neighbors about the political benefits of organic farming promotion. With comparisons now limited to direct ties of the mayor, this negative effect of Bonacich centrality on attitude similarity cannot be simply attributed to increased dissonance arising from exposure to more centrally positioned contacts. Rather, such direction of influence begs the question of what could associate this measure of centrality with a mayor's tendency to significantly differ from his immediate peers with regard to this particular policy attitude. This issue is further discussed in the following section.

Models in Table 3.8 where the practice of organic farming was found to significantly influence the incidence of similarity pertain to perceived political benefits of the organic farming's promotion. Given that this variable's influence is negative, it would seem that

the practice of organic farming creates an initial disparity in perceptions about the political benefits of its promotion. The smaller size of ego networks and the shorter paths between neighbors apparently do not ensure an information exchange process that could bring about some convergence in policy attitudes between mayors who have first-hand knowledge of the technology and their immediate peers. The existence of a communication mechanism in the direct ties within mayors' ego networks should have improved the odds of attitude similarity but since the results showed the contrary, what remains is the task of elucidating why this could be so. I will explore these reasons in the following section.

The influence of network embeddedness traits on the incidence of policy attitude similarities can also be understood in terms of the absolute gaps in perception or attitude scores. The means of these gaps as well as their correlations with embeddedness and other characteristics of the mayor are reported in Table 3.9. The gaps show that most of the respondents were different from their peers in two attitude categories: 1) perceived economic benefits of organic farming, and; 2) the political motivations for its promotion. At both the network and ego network levels, Bonacich centrality had modest to moderate positive associations with attitude gaps for combined technology benefits, political benefits of promotion and over-all receptiveness to organic farming, at both the network and ego network levels. With regard to perceptions about the environmental and health, economic and political benefits of organic farming promotion, increased betweenness centrality was found to be modestly associated with narrower gaps. Increases in degree centrality were found to also modestly correlate with smaller attitude gaps, but only at the ego network level. On the other hand, prestige status was not significantly correlated with

TABLE 3.8. Exact logistic estimates for the incidence of attitude similarity between a mayor and peers in the ego-network (n=24).

Model	Categories of attitude toward organic farming policy									
	Environmental and Health Benefit		Economic Benefit		Combined Benefits of the Technology		Political Benefit of Promotion		Over-all Receptiveness	
	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio
Model 1										
Degree centrality	0.55	1.73	0.51	1.66	0.06	1.06	0.14	1.15	-0.04	0.97
Organic technology use	-0.83	0.44	-1.24	0.29	-0.80	0.45	-1.83 *	0.16	-1.22	0.29
Model score	3.21		4.24		1.12		5.51 *		1.98	
Model 2										
High degree centrality	0.83	2.30	1.04	2.83	0.38	1.46	0.50	1.65	-0.55	0.58
Organic technology use	-0.81	0.44	-1.21	0.30	-0.78	0.46	-1.87 *	0.15	-1.35	0.26
Pr >= score	2.11		3.75		1.25		5.61 *		2.22	
Model 3										
Bonacich centrality	-0.21	0.81	0.21	1.24	-0.45	0.64	-0.90 *	0.41	-0.74	0.48
Organic technology use	-1.21	0.30	-1.15	0.32	-1.33	0.26	-1.44 *	0.24 [i]	-0.21	0.81
Model score	1.58		2.85		2.16		7.94 **		3.96	
Model 4										
High Bonacich centrality	0.42	1.53	-0.77	0.46	-1.13	0.32	-0.24	0.78	-1.13	0.32
Organic technology use	-0.81	0.44	-1.55	0.21	-1.19	0.30	-2.00 *	0.14	-1.62	0.20
Model score	1.59		3.29		2.58		5.48 *		3.10	
Model 5										
Betweenness	0.01	1.01	0.03 **	1.03	0.01	1.01	0.01	1.01	0.01	1.01
Organic technology use	0.11	1.12	-1.73 [i]	0.18	-2.10 [i]*	0.12	-1.82 [i]*	0.16	0.00	1.00
Model score	1.73		5.66 *		1.69		6.08 **		2.10	

TABLE 3.8. (Continued)

Model	Categories of attitude toward organic farming policy									
	Environmental and Health Benefit		Economic Benefit		Combined Benefits of the Technology		Political Benefit of Promotion		Over-all Receptiveness	
	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio
Model 6										
High Betweenness centrality	0.57	1.76	0.78	2.19	0.13	1.14	1.59	4.92	0.50	1.65
Organic technology use	-0.87	0.42	-1.27	0.28	-0.82	0.44	-2.04 *	0.13	-1.24	0.29
Model score	1.67		3.22		1.11		6.82 **		2.13	
Model 7										
ARD	0.04	1.04	0.23	1.26	-0.01	0.99	-0.01	0.99	0.13	1.14
Organic technology use	-1.73	0.18	-1.35	0.26	-0.49	0.61	-2.06	0.13	-0.66	0.51
Model score	1.35		3.56		1.10		5.43 *		2.12	
Model 8										
High ARD	0.38	1.46	1.64	5.13	-0.07	0.93	-0.29	0.75	0.18	1.19
Organic technology use	-0.82	0.44	-1.03	0.36	-0.86	0.42	-2.04	0.13	-1.21	0.30
Model score	1.47		4.69		1.10		5.48		1.99	
Model 9										
Prestige	1.03	2.79	-0.40	0.67	0.55	1.74	1.01	2.74	-1.24	0.29
Organic technology use	-0.98	0.38	-1.31	0.27	-0.86	0.42	-2.07 **	0.13	-1.33	0.26
Model score	2.50		2.80		1.44		6.15 **		3.53	
Model 10										
Effective network size	0.57	1.77	0.66	1.93	0.10	1.11	0.18	1.20	0.14	1.15
Organic technology use	-2.37 [i]**	0.09	-1.35	0.26	-0.95	0.39	-2.45 [i]**	0.09	-0.87	0.42
Model score	2.66		4.20		1.14		5.52 *		2.02	

TABLE 3.8. (Continued)

Model	Categories of attitude toward organic farming policy									
	Environmental and Health Benefit		Economic Benefit		Combined Benefits of the Technology		Political Benefit of Promotion		Over-all Receptiveness	
	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio	Coef	Odds ratio
Model 11										
Efficiency	-4.32	0.01	-0.42	0.65	0.62	1.86	-1.80	0.16	3.18	24.02
Organic technology use	-0.92	0.40	-1.32	0.27	-1.69	0.18	-2.54 [i]**	0.08	-1.14	0.32
Model score	2.43		2.64		1.12		5.55 *		2.38	
Model 12										
Ego network constraint	-0.17	0.84	-2.72	0.07	-0.63	0.54	0.66	1.94	-2.00	0.14
Organic technology use	-0.88	0.41	-1.93	0.14	-1.35	0.26	-2.53 *	0.08	-0.99	0.37
Model score	1.33		3.29		1.13		5.45 *		2.19	
Model 13										
Hierarchy	3.17	23.76	-2.78	0.06	-1.76	0.17	-0.38	0.68	4.84	127
Organic technology use	-1.14	0.32	-1.77	0.17	-1.01	0.36	-2.59 [i]**	0.07	-1.04	0.35
Model score	1.65		2.86		1.19		5.43 *		2.34	

[i] median unbiased estimate (MUE)

** significant at 10% alpha*

*** significant at 5% alpha*

**** significant at 1% alpha*

the attitude gaps between mayors. Ego network hierarchy had a modest negative correlation with network-level perception gaps regarding the combined benefits of organic farming. With regard to perceived economic benefits of organic farming, a larger effective ego network size was associated with narrower gaps while higher ego network efficiency was modestly correlated to the widening of that gap.

The practice of organic farming was found to be associated with increases in all attitude gaps except for perceived environmental and health benefits of organic farming, both at the network and ego network levels. These results are consistent with the pattern of relationship noted in the exact logistic estimations. It is also notable from the correlations that the older mayors tend be moderately associated to having more years in service, owning a farm and the practice of organic farming. A moderate positive relationship between the mayor's years in office and Bonacich centrality suggests how the length of tenure can improve not only the number but also the quality of a public official's connections. The results of correlations also point to some moderate difference in social capital associated with the mayor's age as older mayors were found to exhibit higher ego network efficiency, less constraint from local ties, and less concentration of influence from any of those local ties.

The OLS estimates confirm the influence of Bonacich centrality and the practice of organic farming on the policy attitude differences between mayors and fellow mayors. None of the other embeddedness measures hypothesized to influence the incidence of attitude similarities were found to significantly influence mayors' attitude gaps either. In the network level models (Table 3.10), estimates indicate that an increase in Bonacich centrality widens the perception gaps about the income benefits of organic farming, the

TABLE 3.9: Correlations for mayoral characteristics and attitude gaps.

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Age (yrs)	54.04	11.83	1.00														
2 Female	0.13	0.34	0.03	1.00													
3 Experience (yrs)	4.96	4.85	0.42	-0.16	1.00												
4 Majority party affiliation	0.50	0.51	0.43	0.13	0.11	1.00											
5 Farm owner	0.54	0.51	0.47	0.09	0.40	0.25	1.00										
6 Organic technology user	0.42	0.50	0.54	0.19	0.49	0.17	0.78	1.00									
7 Degree centrality	3.88	1.26	-0.07	0.04	-0.14	-0.17	-0.16	-0.12	1.00								
8 Betweenness centrality	61.46	49.35	-0.03	-0.11	-0.04	-0.22	-0.06	-0.10	0.82	1.00							
9 Closeness centrality (ARD)	14.58	1.95	0.11	0.03	-0.10	-0.26	-0.02	0.02	0.86	0.73	1.00						
10 Bonacich centrality	1.00	1.00	-0.21	-0.05	0.39	-0.38	-0.33	-0.18	0.34	-0.05	0.43	1.00					
11 Prestige status	0.29	0.46	-0.07	0.03	0.24	0.09	0.04	0.02	0.44	0.39	0.26	-0.04	1.00				
12 Effective ego network size	3.37	1.04	0.10	-0.01	-0.05	-0.18	-0.03	-0.04	0.94	0.89	0.88	0.18	0.42	1.00			
13 Ego network efficiency	0.88	0.11	0.44	-0.17	0.26	-0.08	0.35	0.20	-0.33	0.03	-0.05	-0.40	-0.10	0.02	1.00		
14 Constraint	0.43	0.14	-0.48	0.11	-0.24	0.08	-0.38	-0.23	-0.26	-0.52	-0.46	0.23	-0.08	-0.56	-0.79	1.00	
15 Hierarchy	0.08	0.08	-0.44	-0.15	-0.22	-0.09	-0.38	-0.29	0.20	-0.03	-0.03	0.18	0.36	0.01	-0.51	0.57	1.00
Attitude gaps between mayor and the entire network																	
15 Env. & health benefits	0.58	0.40	0.29	0.21	0.02	0.46	-0.01	0.00	-0.08	-0.34	0.06	0.15	0.03	-0.12	-0.04	0.04	-0.10
16 Economic benefits	1.43	1.18	0.23	0.07	0.16	-0.02	0.30	0.43	-0.26	-0.25	-0.11	0.11	0.07	-0.18	0.23	-0.03	-0.07
17 Combined benefits	0.82	0.68	0.41	0.19	0.13	0.14	0.45	0.53	-0.06	-0.16	0.09	0.25	-0.02	-0.01	0.15	-0.19	-0.33
18 Political benefits of	1.03	0.78	0.11	-0.01	0.04	-0.06	0.33	0.38	-0.10	-0.26	0.00	0.43	0.02	-0.19	-0.21	0.20	-0.16
19 Over-all receptiveness	0.77	0.57	-0.06	0.22	0.18	-0.11	0.33	0.34	0.02	-0.13	0.02	0.29	0.13	-0.06	-0.21	0.14	-0.15
Attitude gaps between mayor and the ego-network																	
20 Env. & health benefits	0.56	0.47	0.24	-0.33	0.16	NA	0.03	0.14	-0.31	-0.21	-0.06	-0.11	-0.04	-0.27	0.19	0.04	-0.04
21 Economic benefits	1.64	1.55	0.19	-0.03	0.03	NA	0.27	0.21	-0.41	-0.34	-0.19	0.09	-0.13	-0.32	0.32	-0.02	-0.06
22 Combined benefits	0.78	0.87	0.37	-0.19	0.05	NA	0.38	0.41	-0.13	-0.10	0.08	0.22	-0.19	-0.06	0.19	-0.15	-0.25
23 Political benefits of	1.15	0.97	0.27	-0.32	0.25	NA	0.23	0.29	-0.21	-0.27	-0.06	0.26	-0.06	-0.18	0.17	-0.09	-0.10
24 Over-all receptiveness	0.85	0.75	0.18	-0.29	0.21	NA	0.28	0.28	-0.15	-0.18	-0.02	0.24	-0.08	-0.12	0.14	-0.08	-0.08

TABLE 3.10: OLS estimates for attitude gaps between surveyed a mayor and peers in the network (n=24).

	Categories of attitude toward organic farming policy									
	Environmental and Health Benefit		Economic Benefit		Combined Benefits of the Technology		Political Benefit of Promotion		Over-all Receptiveness	
Variable	Beta	se	Beta	se	Beta	se	Beta	se	Beta	se
Organic tech user	-0.02	0.16	0.96 **	0.45	0.70 ***	0.24	0.79 ***	0.27	0.46 *	0.22
Degree			-0.19	0.18						
Betweenness	0.00	0.00								
Bonacich					0.26 **	0.12	0.37 **	0.14	0.20 *	0.11
Constraint (Ego)							1.18	1.02		
Hierarchy (Ego)					-2.05	1.48				
Constant	0.76 ***	0.15	1.78 **	0.78	0.42 *	0.23	-0.18	0.49	0.38 *	0.19
R-squared		0.1136		0.2306		0.4506		0.4314		0.2362

TABLE 3.11: OLS estimates for attitude gaps between a mayor and peers in the ego-network (n=24).

	Categories of attitude toward organic farming policy									
	Environmental and Health Benefit		Economic Benefit		Combined Benefits of the Technology		Political Benefit of Promotion		Over-all Receptiveness	
Variable	Beta	se	Beta	se	Beta	se	Beta	se	Beta	se
Organic tech user	0.09	0.19	0.35	0.62	0.73 **	0.33	0.66 *	0.38	0.49	0.30
Degree	-0.11	0.08								
Betweenness			-0.01	0.01						
Bonacich					0.35 *	0.18	0.31	0.19	0.22	0.15
Efficiency (Ego)			4.19	2.73	2.01	1.57				
Hierarchy (Ego)										
Constant	0.96 ***	0.33	-1.55	2.41	-1.64	1.46	0.57	0.33	0.43	0.26
R-squared		0.1089		0.2350		0.3087		0.1825		0.1618

political benefits of its promotion, and the over-all receptiveness to the prospective policy. Such growth in attitude disparities arising from a higher extent of a mayor's direct and indirect relations contradicts the expectation that increased embeddedness would draw one's attitude closer to the mean attitude of the entire group. Another major finding from the estimations is the positive influence of the practice of organic farming the network level gaps for all but one attitude categories. In Table 3.11, the model for the gaps in perceived combined benefits of organic farming reflects the same relationships at the ego network level. All these findings are consistent with the results of the exact logistic regression since widened attitude gaps reduce the odds of attitude similarities.

3.6 Discussion and Conclusion

The rankings of centrality scores, which the mayor of Tubigon consistently topped, revealed that having more direct ties coincides with less dependence on intermediaries to reach other mayors as well as lying on the most number of paths between other mayors. Incidentally, these measures of centrality---degree, closeness and betweenness--- were found to positively correlate with a mayor's prestige status. In terms of Bonacich centrality, the mayors of Bilar and Alicia were tied at having the most well-connected relations. Delineating the concept of prominence into these separate measures was demonstrably useful in evaluating positional advantages among mayors in the social network. As analyses later showed, it also aided meaningful assessment how visibility in the network influences attitude similarities between mayors.

The regression analyses established support for the role of embeddedness in the convergence of mayors' policy attitudes through the positive influence of betweenness centrality on the odds of a mayor agreeing with ego network peers regarding the

economic benefits of organic farming. Other centrality measures were not found to significantly improve consensus in any of the policy attitude categories. The influence of a mayor's embeddedness on convergence of policy attitudes is hence singularly determined here by how much the local official is strategically positioned between fellow mayors within the ego network. A higher betweenness centrality renders the central mayor as an influential actor in the local network, be it as a source, consumer or intermediary of information exchange relevant to a prospective policy. Through any of these roles, the more central mayor is endowed with more opportunities to engage in and facilitate consensus-building information exchange with other mayors in the network.

While the results do not provide support for the influence of the other centrality measures on policy attitude similarities, one unanticipated finding from the analyses warrants further discussion. The exact logistic estimations revealed that high Bonacich centrality reduces the odds of a mayor agreeing with peers in the broader network level about the combined benefits of organic farming. The OLS estimations also showed that increases in Bonacich centrality widen attitude gaps about the technology and its promotion. These results are contradictory to the earlier presented expectations of centrality's general effect on relative policy attitudes of mayors. Being connected to well-connected peers in the network provides an individual with more opportunities to be exposed to interpersonal influences, which in turn integrate conflicting opinions toward a consensus (Friedkin & Johnsen, 1999). How could greater exposure to information exchange not only fail to make a mayor imbibe the mean attitudes of other mayors in the network but also cause their attitudes to be significantly dissimilar from those? I propose here that this resulting disparity in policy attitudes cannot be simply attributed to the

extent of a mayor's positional advantage in the network. Rather, a mayor's Bonacich centrality may just be coinciding with an unquantifiable human quality that actually explains the attitude disparity with the rest of the network. Mayors who have well-connected ties apparently possess skills that enable them to make those strategic relations in the network. This same set of skills, which can be described as a kind of "strategizing know-how," is shaped by one's years of experience in office as well as aptitude. Recalling that the majority of respondents possessed comparable academic credentials, aptitude here must refer to a decision-making ability that transcends educational background. Strategizing know-how must therefore account for the significant disparities in policy attitudes displayed by the more central mayors. Furthermore, such skill can also manifest in how these local officials withhold personal reservations for political reasons. The OAA is generally perceived as a "pet project" of the central government, a policy associated with the environmental advocacies of the incumbent agriculture secretary. The "socially savvy" mayor who also happens to hold conservative views about the prospective policy would be inclined to keep his knowledge and negative opinions about the technology to himself to maintain a harmonious relationship with officials in the higher government tiers.

Another interesting result from the analyses is negative influence of practicing organic farming on the odds of a mayor sharing the attitude of his network peers about the benefits of the technology and its promotion. Reported practice of the technology was also found to widen policy attitude gaps. I propose a few conjectures to explain this pattern of influence. First, these findings suggest that first-hand experience of the technology may generate for a mayor a different set of knowledge and perceptions about

organic farming than what the rest of the network knows on average. Secondly, mayors must value experience-based understanding of organic farming over other information available to them. Finally, mayors who possess experience-based information about organic farming may not be actively engaged in the discourse about the technology such that their biases, along with those of other mayors, are perpetuated and manifested in the observed policy attitude disparities. Given that significant disparities in attitudes were found even at the level of ego networks, it seems that the communication exchange that would have bridged differences in knowledge and eventually, policy attitudes, either did not materialize or proved ineffective, even with the existence of a communication network structure. Therefore, socially influencing the policy attitudes of mayors not only necessitates the existence of social structures deemed to channel communication exchange but also depends on the content and engagement of key actors in the relevant discourse supposedly being channeled by the social network.

The analyses failed to substantiate the influences of the other embeddedness traits on the similarities in mayors' attitudes about organic farming and the prospective policy of promoting the technology. Although prestige status was expected to lead to emulation, mayors who were identified as objects of their colleagues' attention and deference did not exhibit similar policy attitudes with mayors in their immediate and broader networks. The regression estimations also did not provide support for the effect of tie strength on policy attitude similarities between mayors and their network peers. Apparently, structural holes within each mayor's ego network did not materialize into sufficient exposure to social influence and information from the broader network, at least not to the extent of bringing about policy attitude similarities. In addition, the results suggest that although redundant

ties and constraints are looked upon to promote cohesion within the ego network, these traits do not necessarily ensure similarities in policy attitudes between mayors and their immediate neighbors.

To put additional perspective to the attitude gaps in these analyses, I revisited the receptiveness scores on which the gaps were based. Intriguingly, the same two variables that were found to significantly widen attitude gaps--- Bonacich centrality and the practice of organic farming--- were also negatively correlated to the receptiveness scores. Results of the correlations for Bonacich centrality indicate that mayors who have well-connected ties not only tend to think differently about organic farming than the other mayors; they also have more conservative attitudes about the technology. Such pragmatism can be interpreted as attitude manifesting mayors' strategizing know-how. With regard to the somewhat sobering influence of experience with organic farming on mayors' receptiveness to the technology, such pattern echoes cases in the Philippines and India where early adopters gave accounts of the technology's productivity setbacks (Mendoza, 2004; Sharma, et al, 2008; Panneerselvam, Hermansen & Halberg, 2010). Mayors who wear the same hat of technology adopters would understandably be less optimistic than their peers about perceived benefits of organic farming because they are privy to these less than ideal immediate outcomes of organic farming.

3.7 Implications for Policy and Practice

As originally intended, this study speaks to the relevance of social networks in the process of policy learning for Philippine municipal governments. Findings point to the potential of tapping into mayors' social networks for the diffusion of new local policy initiatives as well as regional and national policy agenda since higher betweenness

centralities for mayors were found to enhance the pace of information dissemination in the network. Given that betweenness centrality was found to significantly improve the odds of attitude similarity between mayors and their immediate peers, this embeddedness measure can be used as basis for identifying crucial actors for area-wide dissemination of policy information. The finding also highlights the value of identifying and thereby encouraging ties that bring key governance actors to positions of access to information exchange with other officials.

Fortunately, there are institutions in the country such as the League of Municipalities of the Philippines (LMP), the Department of Interior and Local Government (DILG), provincial governments and non-government organizations (NGOs) that can foster the development and strengthening of strategic ties between local officials. For instance, Boholano mayors are organized into a provincial league that holds monthly meetings in the provincial capital. Annually, the LMP organizes conferences for each of the three island clusters of municipalities in the country. Such assemblies promote camaraderie while also serving as venues for policy dialogues. Both are useful policy learning tools that can guide the governance choices of the local officials.

While it is easy to surmise that this study ‘s ultimate policy goal is widespread adoption of organic farming technology, the intention of this inquiry is not necessarily the attainment of such results. Instead, its definitive focus is the attainment of local policy convergence through similarities in policy perceptions among local officials. Such a goal may be applicable to various contexts of policy innovations although this particular inquiry is directed at the prospect of organic technology promotion of the local government.

The disparities in policy receptiveness—between mayors who have used the technology to be promoted by the prospective policy and those who don't—illustrate the gaps in information that arise from unshared first-hand learning. Creation of opportunities for direct information exchange like policy-specific fora and consultations can help bridge such knowledge gaps. Furthermore, the negative influence of the practice of organic farming on policy attitude similarity (within ego-networks) suggests that the existence of direct mayoral interactions does not guarantee a communication mechanism relevant to the building of consensus for the prospective policy. For this reason, targeted discourses through which mayors can have access to the exchange of experiential knowledge and peer feedback are crucial. The value of policy-specific consultations for this prospective policy, as well as for others that come along, cannot be overstated.

With regard to the observation of lower receptiveness to organic farming among mayors who use the technology, the implications pertain to how the experience of "early adopters" with productivity setbacks might be addressed. As with any other type of agricultural innovation, continued and rigorous agronomic research can help clarify the general public understanding about the impacts of organic technology. The scientific community would need the political and fiscal support of the public sector—local and nationa—in order to pursue such objective. Incidentally, the OAA declares the national government's commitment to this end. Moreover, continued commitment of national agencies, the academe and local governments to a coordinated sharing of the latest innovations and field reports can help ensure the accurate assessment and attainment of the technology's target outcomes. Institutional support from the national government is crucial in building and strengthening these partnerships.

Early adopters' concern about low productivity in organic farming is closely tied to its impact on farm incomes. Where there are specialized markets for organically grown produce, low productivity can be offset by price premiums (Nemes, 2009). Conversely, the lack of access to niche markets as well as established certification systems makes low farm productivity difficult to economically justify, even with lower input costs of the technology. Considering that these crucial institutions are still currently being developed around the country, many early adopters have yet to take access the compensatory price adjustments in organic produce markets. To this end, the setting up of certification systems around the country as well as the creation of links to specialized markets for organic produce must be expedited.

While the discussion of productivity setbacks is so far depicted here as a direct impact of the technology, it can also be argued that results experienced by early adopting mayors may be brought about by environmental spillovers which could similarly influence perceived health and environmental impacts of organic technology. When organic farming is practiced partially and unsystematically in an area, the adopting farms are not immune from seepage of chemicals and migration of pests from adjacent conventional farms. Lows productivity can hence arise. This implies that the effect of organic technology is contingent on the scope and scheme of its adoption. Elevating the promotion of organic technology from individual toward community and regional levels of adoption can help mitigate the effects of spillovers that contaminate the technology's impact. In this way, convergence patterns in attitudes and eventual actions of local officials with regard to the prospective policy impacts the realization of the technology's ultimate productivity, economic and environmental outcomes for farmers and local

communities who are ultimately affected by the wide use (or non-use) of organic technology in farming.

3.8 Caveats and Future Work

On account of small sample size, this study suffers from generalizability issues. However, it is exploratory in its approach to the understanding socially embedded policy learning and hence focuses on lessons that inform the understanding of the mechanisms of socially mediated policy learning. Extension of this research to include a larger representative sample size is the instinctive next step.

This study used single-period network and attitude survey data that were collected at the heels of the OAA's promulgation. It presents a "snapshot" of mayoral networks in Bohol along with the policy attitude patterns of these LGU officials at a relatively early stage of the corresponding local policy's dissemination. While the findings here are an informative guide to understanding the early patterns of attitude similarities in mayoral networks, shifts in mayoral relations and continuing information exchanges over time result into a dynamic relationship between embeddedness and the relative policy attitudes of mayors. Expansion of research toward a longitudinal focus is aptly the subject of a follow-up work.

The timing of the research also limited this investigation to the influence of network embeddedness on policy attitude similarities for mayors rather than patterns of policy convergence for municipalities. Since latter is best captured in the more advanced phases of the policy's diffusion process, a later study will look into this variable in relation to mayoral embeddedness. As there are other actors that play crucial roles in local policy making and governance, this inquiry can also be expanded to explore the

social organization of other local policy actors, such as other elected local government officials, bureaucrats, and community group leaders. Embeddedness traits of these actors can likewise be explored in relation to policy learning processes and outcomes.

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APPENDIX A: SAMPLE E-REPORT FOR AGRICULTURAL SUPPORT PERFORMANCE

e-SLGPR

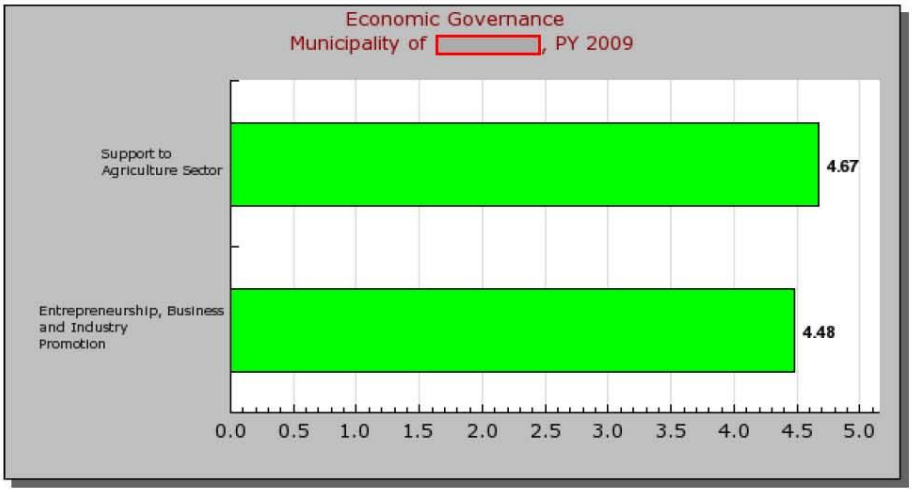
State of Local Governance Performance, Electronic Report

Municipality of_____ PY 2009

Highlighted in this report is your LGU's performance in four (4) areas of governance: (1) Administrative Governance, (2) Social Governance, (3) Economic Governance, and (4) Environmental Governance. A special report is included to determine how the fundamentals of good governance such as Participation, Transparency, and Financial Accountability are valued in the LGU. It is to note that the LGU's performance was assessed based on the responses of the LGU's Team to the questions provided into the LGPMS database. A Performance Scale is used to identify areas with excellent performance and areas for improvement. A perfect scale of 5 denotes excellent performance while performance scales of 1-4 indicate areas for improvement. Although scales of 3 and 4 are relatively high, there are areas which can still be improved on. All these are explained in detail as you read the entire report.

On Economic Governance

Economic Governance looks into three areas: Support to Agriculture Sector, Support to Fishery Services, and Enterprise, Business and Industry Promotion. The report varies according to the nature of economic activities in the locality. Support to agriculture or fishery services are filtered out if not applicable. Your LGU performance in this area is plotted in the graph below.



Area(s) with Excellent Performance

None of the 2 areas in *Economic Governance* marked "excellent performance" so far. Meantime, dedicate more time and effort on the areas for improvement.

APPENDIX A: (CONTINUED)

Area(s) for Improvement

The areas for improvement are listed by priority, starting from the area which gets the lowest performance scale followed by areas which get higher performance scales, respectively.

Priority Area for Improvement	Performance Description	Interpretation
Entrepreneurship, Business and Industry Promotion	4.48 High but not Excellent	More need to be done to institutionalize a business-friendly environment. Factors such as the following need to be looked into:
Suggested Action(s) to Take		
• Improve the quality of permitting or licensing • Provide, or cause the provision of, direct support services to business, particularly those categorized as micro, small and medium enterprises. Support services may come in the form of tax incentives, product labeling, product packaging, training, job fairs and trade fairs		

Priority Area for Improvement	Performance Description	Interpretation
Support to Agriculture Sector	4.67 High but not Excellent	Local government support is extended to the Agriculture Sector. But greater intervention is necessary.
Suggested Action(s) to Take		
• Improve infrastructure support, e.g., communal irrigation system, farm-to-market roads, post-harvest facilities • Improve credit facilitation services to farmers • Extend adequate production support, e.g., planting materials, fertilizers, and laboratory services such as soil testing • Provide assistance to research and development, e.g., techno-demo cooperators, and research institutes • Improve market development services, e.g., trade fairs, exhibits, missions and congresses		

APPENDIX B: DATA CAPTURE FORM FOR AGRICULTURAL SUPPORT PERFORMANCE

Performance Area: Economic Governance
Service Area: Support to Agriculture Sector

Instruction: Instruction: Your answers to the questions below determine your LGU performance in providing support to farmers and to the agriculture sector in general. This form is applicable to LGUs with agricultural ecosystem only. Take note that this is a self-assessment tool. Please answer all items.

1. On support to agriculture. Determine the level of support to agriculture using the criteria below.

On infrastructure support:

1.1 Rehabilitation or construction of irrigation system for irrigated or irrigable areas.
- OFull
- OHigh
- OLow
- ONone
- ONA

1.2 Provision of post-harvest equipment, machines or facilities, i.e. threshers, harvesters, driers milling machines, storage, etc.
- OFull
- OHigh
- OLow
- ONone
- ONA

1.3 Rehabilitation or construction of feeder roads or farm-to-market roads.
- OFull
- OHigh
- OLow
- ONone
- ONA

On local government agricultural extension and on-site research services or facilities:

1.4 Credit facilitation services (non-collateralized loans to poor farmers, i.e. loan access, insurance and credit guarantees through cooperatives or other financing institutions.
- OFull
- OHigh
- OLow
- ONone

1.5 Production support services, i.e. planting materials, fertilizers and other soil ameliorants, or laboratory services such as soil testing and similar services.
- OFull
- OHigh
- OLow
- ONone

1.6 Research and development services, i.e. assistance to research projects, and techno demo cooperators.
- OFull
- OHigh
- OLow
- ONone

1.7 Market development services, i.e., trade fairs, exhibits, missions and congresses.

APPENDIX B: (CONTINUED)

○Full
○High
○Low
○None

Notes:

1. Answer "Full" if the support is fully provided and funded by the LGU.
2. Answer "High" if the support is provided and funded by the LGU, Provincial Government, Department of Agriculture, farmers, and/or other donor agencies through a cost-sharing scheme.
3. Answer "Low" if the LGU only plays a coordinative function of the Department of Agriculture, and/or other donor agencies, and that there are no funds provided by the LGU.
4. Answer "None" if there is a need or demand for such service or agricultural support but is not provided by the LGU due to financial or technical constraints.
5. NA if the rehabilitation or construction of infrastructure support is not applicable, e.g., agricultural land is not an irrigable land in the case of the provision of irrigation system, or not yet needed since there is already a complete and functional infrastructure support.

2. **On the extent of farming household-beneficiaries. Determine the extent of farming households benefiting from agricultural extension and on-site research services or facilities, in %.**

○ 80% or more
○ 50 - 79%
○ Below 50%

Notes:

1. To compute, (number of farming households availing of agricultural extension and on-site research services or facilities ÷ total number of farming households) x 100.

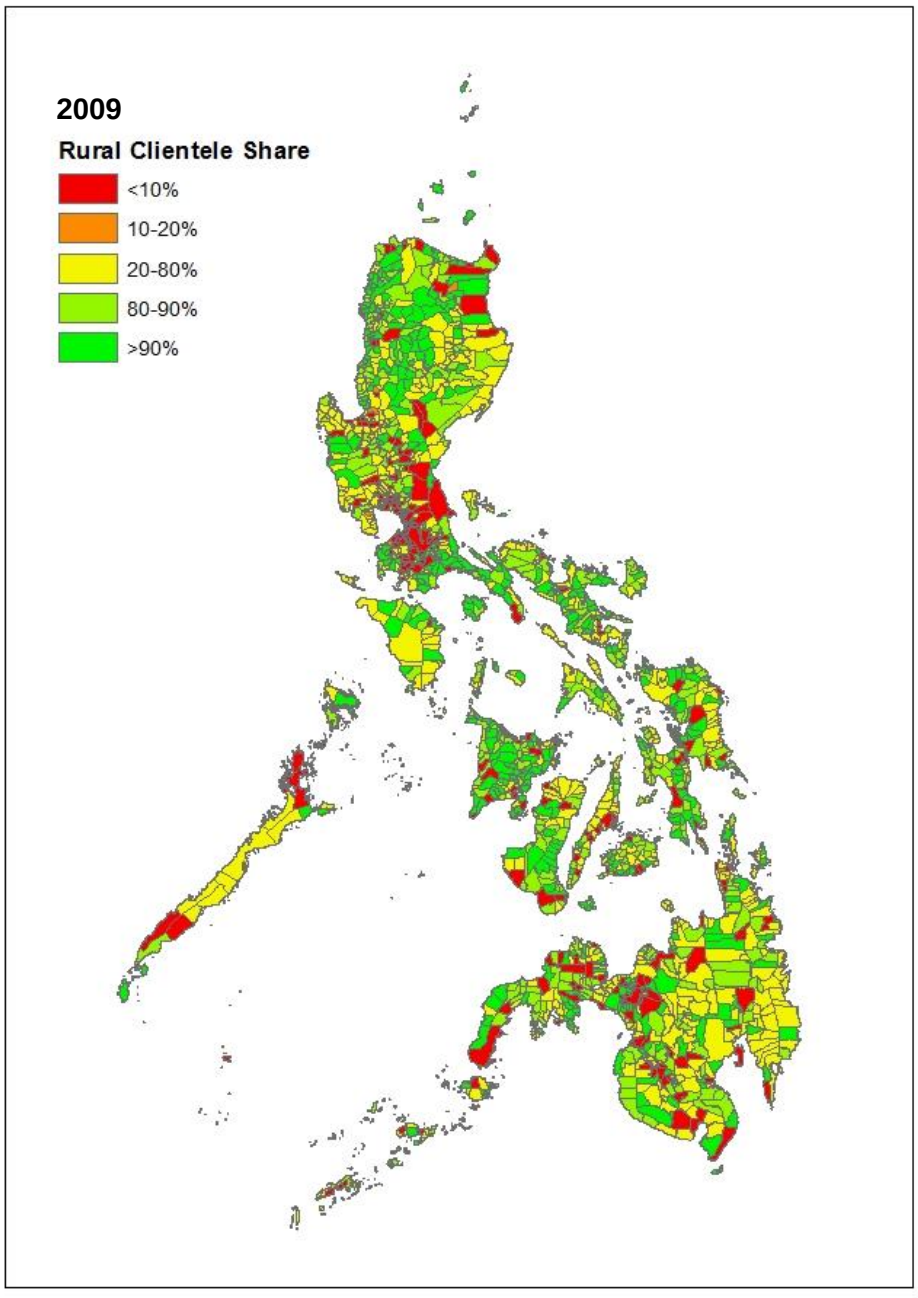
3. **On alternative and innovative assistance to farmers. Does your LGU have an alternative or innovative assistance to farmers? (bonus point)**

○Yes ○No

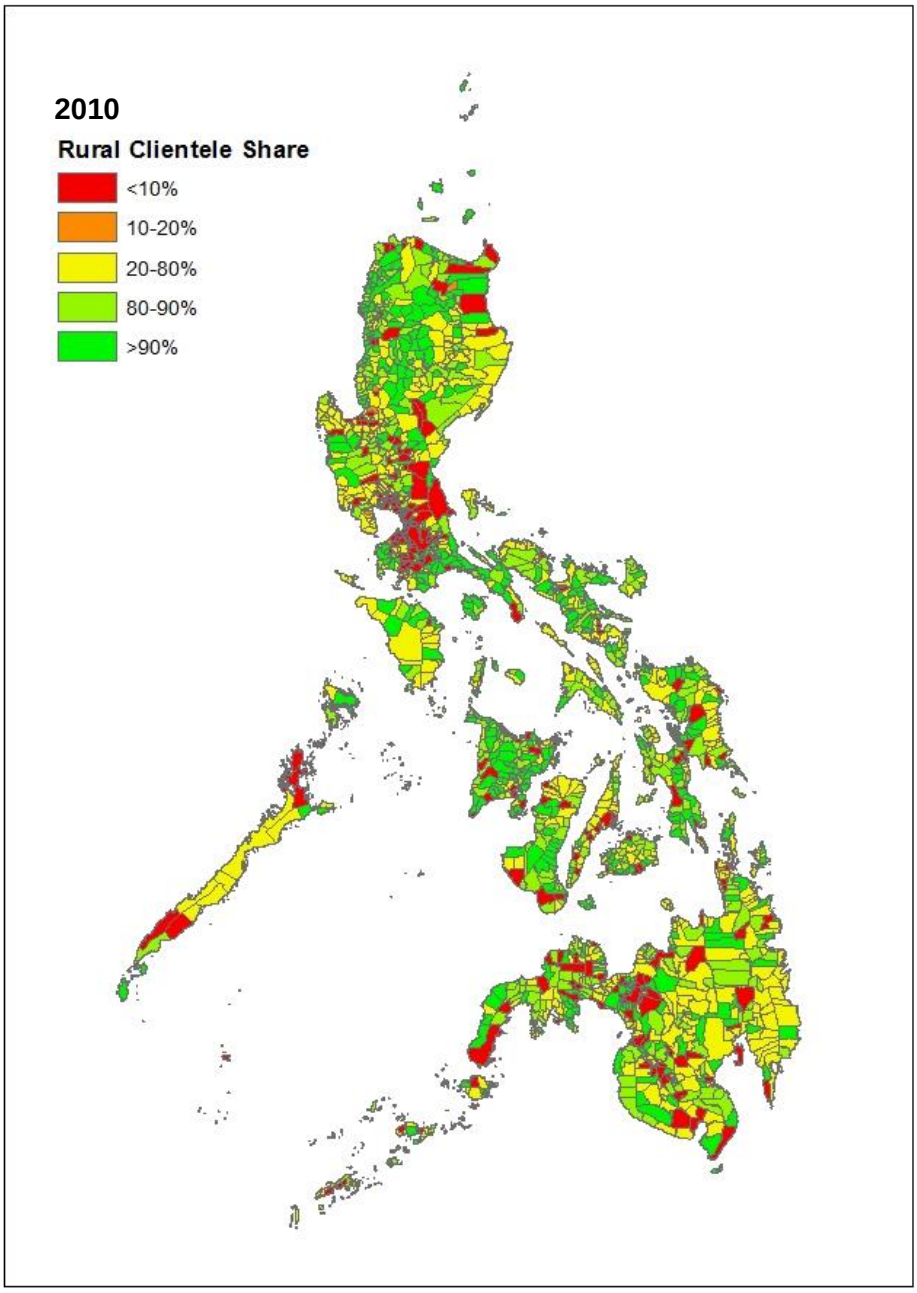
If yes, give the title of the said program or project.

Program/Project Title:

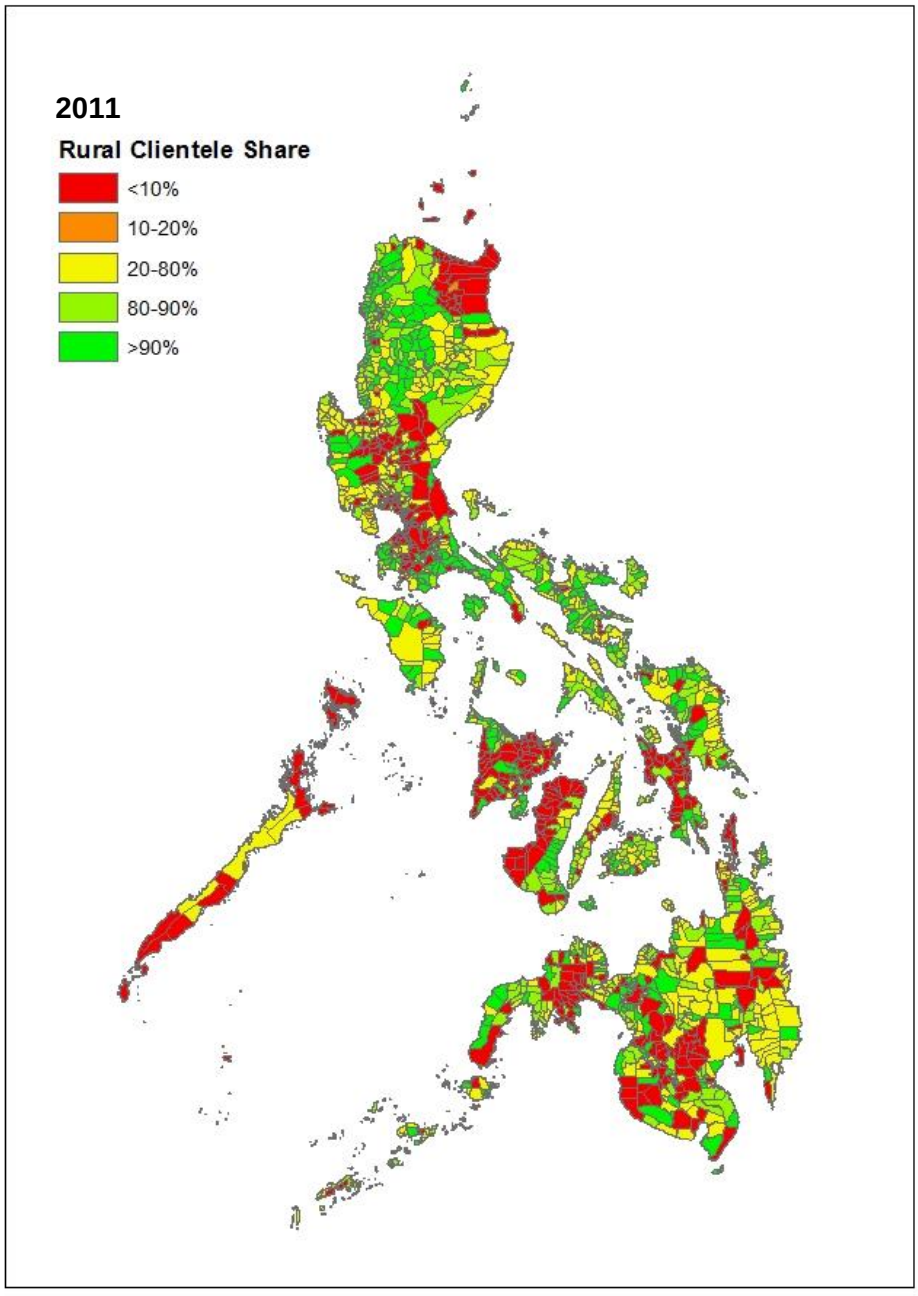
APPENDIX C: RURAL CONSTITUENCY SHARE DISTRIBUTION 2009-2011



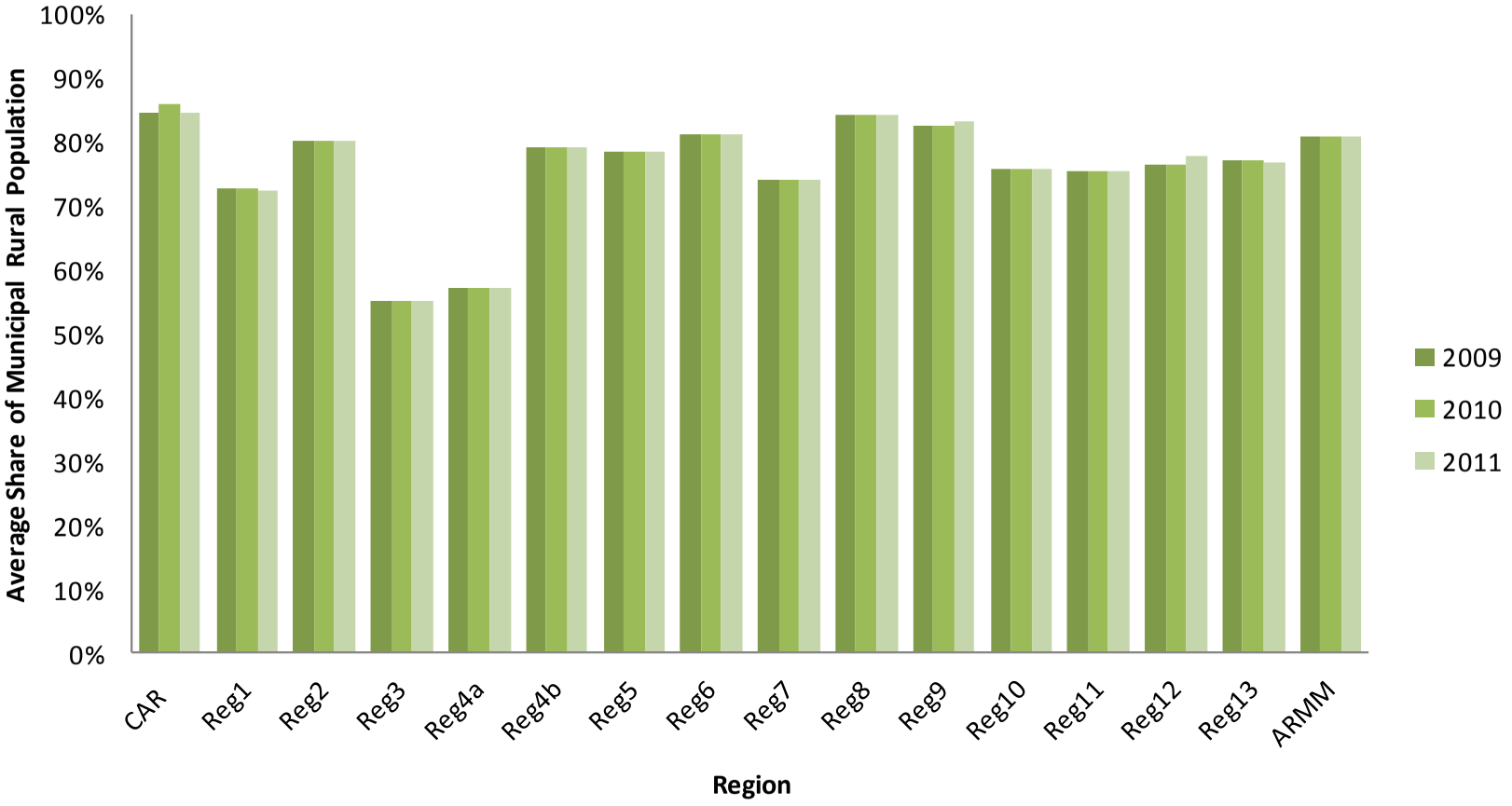
APPENDIX C: (CONTINUED)



APPENDIX C: (CONTINUED)



APPENDIX D: RURAL CONSTITUENCY SHARE DISTRIBUTION
BY REGION, 2009-2011



APPENDIX E: SAMPLE LBP FORM NO. 3

PROGRAMMED APPROPRIATION AND OBLIGATION
BY OBJECT OF EXPENDITURE
OFFICE/SPECIAL PURPOSE APPROPRIATIONS: MUNICIPAL AGRICULTURAL OFFICER

Object of Expenditure	Acct Code	Past Year 2010 (Actual)	Current Year 2011 (Estimate)	Budget Year 2012 (Proposed)
(1)	(2)	(3)	(4)	(5)
1.0 Current Operating Expenditures				
1.1 Personal Services				
Salaries and Wages-Regular	701	379,008.00	650,544.00	568,740.00
PERA	711	72,000.00	54,000.00	72,000.00
Clothing/Uniform Allowance	715	12,000.00	12,000.00	12,000.00
Productivity Incentive Allow.	717	6,000.00	6,000.00	6,000.00
Other Bonuses and Allowances	719	9,000.00	9,000.00	9,000.00
Cash Gift	724	15,000.00	15,000.00	15,000.00
Year End Bonus	725	31,584.00	54,212.00	47,395.00
Life and Ret. Ins. Contributions	731	45,482.58	78,065.28	68,248.80
PAG-IBIG Contributions	732	3,600.00	3,600.00	3,600.00
PHILHEALTH Contributions	733	4,500.00	4,950.00	6,900.00
ECC Contributions	734	3,600.00	3,600.00	3,600.00
Other Personnel Benefits	749	105,000.00		
Total Personal Services		**686,774.58**	**890,971.28**	**812,483.80**
1.2 Maintenance and Other Operating Expenses				
Traveling Expenses-Local	751	40,000.00	60,000.00	50,000.00
Office Supplies Expenses	755	15,000.00	15,000.00	15,000.00
Animal/Zoological Sup. Exp.	757		20,000.00	20,000.00
Other Supplies Expenses	765	10,000.00	10,000.00	10,000.00
Telephone Exp.-Mobile	773	5,885.00	6,000.00	6,000.00
Representatiom Expenses	783			10,000.00
R/M-Office Equipment	821			5,000.00
R/M-IT Equipment & Software	823		15,000.00	10,000.00
Other Maint. & Oprtg. Exp.	969		10,000.00	5,000.00
Total Maint. & Oprtg. Exp.		**70,885.00**	**136,000.00**	**131,000.00**
2.0 Capital Outlay				
Office Eqpt-Aircon unit	221	28,872.00		
Furniture and Fixtures	222		20,000.00	
IT-Equipment & Software	223			
-Laptop				20,000.00
-monitor				15,000.00
-Television Set		8,290.00		
-VCD Player		7,218.00		
Communication Equipment	229	1,985.00		
-Karaoke				
Total Capital Outlay		**46,365.00**	**20,000.00**	**35,000.00**
3.0 Financial Expenses				
20% Development Fund			462,000.00	200,000.00
Total Financial Expenses			**462,000.00**	**200,000.00**
Total Appropriations		**804,024.58**	**1,508,971.28**	**1,178,483.80**

Prepared:	Reviewed:	Approved:
MAO	Local Budget Officer	Local Chief Executive